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The Paris Exhibition: A General Survey.

THOSE who intend to visit the Great Exhibition at Paris should be warned that it will be quite useless to go there before six weeks are out (and perhaps two months would be nearer the mark) if they want to see the exhibits in anything like a complete state. The Champ de Mars is at present a railway goods yard, and the Esplanade des Invalides, the other large area flanked by buildings, is in equal confusion. As to the exhibits, there is literally scarcely anything in the place, unless it be in the smaller Palais des Beaux-Arts, into which entrance was forbidden to every one, presumably because something was really getting done there. But the opposite and larger palace, however noble its architectural appearance outside, is merely an empty shell—nothing to be seen whatever. It was the same in the buildings dedicated to industrial exhibits, on the Champ de Mars; we went into several, but nothing was to be seen but confusion and empty stalls, or skeletons of stalls in preparation. It is a thousand pities that things have been allowed to drag on so late, for the Exhibition will probably lose many visitors by being in this inchoate stage during the month when Paris is most attractive. In July there will be a grand show; but people do not care so much to go to Paris in the heat of July.

A good many of the buildings on the Champ de Mars site are not even quite finished externally, but they are complete enough for one to form a good estimate of the general appearance from an architectural point of view. In a certain sense the buildings are more remarkable than those of the 1889 Exhibition; there is an extraordinary vitality and vigour in the designs, and much evidence of that facility and freedom in modelling which is so remarkable a quality of modern French architecture; but it is a question whether there is not too much modelling—too constant a recurrence of curves and scrolls everywhere, so that there seems to be no repose; moreover, the constant introduction of nude figures balanced on the edge of a cornice or escutcheon, and hanging their feet out in the air, though it must be admitted that the figures are always well modelled, becomes a mannerism which is repeated rather too often. There is certainly no building on the Champ de Mars site to equal those two admirable buildings designed by M. Formigé which stood on each side of the ground in the 1889 Exhibition, and which we always thought were much too good to have been destroyed, since they were quite solidly enough constructed to have stood for many years.

The Exhibition commences, at this part, above the Pont d'Iena, between it and the Trocadéro, where the foreign colonies buildings make a picturesque group The Pont d'Iena has been widened by throwing out foot-passenger walks on cantilevers outside the stone balustrade. Immediately below it is a miscellaneous assemblage of buildings with no special grouping; and below the Eiffel Tower commences the great parallel range of buildings on each side of the ground, the vista being closed at the south end by the Château d'Eau, of which we have given an illustration (see *Builder*, October 21, 1899), and which, with its cascades pouring down the successive steps or stages in front, will no doubt have a most brilliant effect, but when this will be available it would be difficult to pronounce. Of the buildings on either side, the best portions are those towards the southern end of the ground, which have a less showy and more architectural character; the very lofty arched loggias on the upper story, with the delicate blue and buff colouring of the vaults showing between the white columns, have a very good effect. The Galerie des Machines, which it will be remembered runs across the southern end of the Champ de Mars, is quite transformed internally; it is a chaos of erections, many of them in the form of imitation buildings in various styles; among the various erections we find the built-up bows and bowsprit of a great ship, the size of life, if one may so phrase it. The centre portion of the Galerie has been laid out as a great square compartment with a brilliantly coloured glass dome over it. When we saw the preparations for this last year, we expressed some regret at the vista of that grand iron roof being broken into; but we must confess, on seeing it executed, that this will be one of the great interior effects of the Exhibition. It is here that the opening ceremony will take place. This centre compartment is divided from the rest of the Galerie by a lofty architectural screen on each side, of very striking and effective design.

The southern end of the Champ de Mars has been connected with the southern end of the Esplanade des Invalides by two elevated roads built on the broad foot-pavements of the Avenue de la Motte Piqué; that on the north, on iron supports, carrying a railway, that on the south side, on wooden piles, carrying a bridge for foot-passengers. The iron piers for the railway are well designed, both in regard to appearance and construction; the lower bay of the truss forms an arch, under which the ordinary foot traffic of the street can be continued. When we arrive at the entrance to the Esplanade des Invalides portion of the exhibition we find things on a higher artistic level than at the Champ de Mars. The façade facing the Invalides, with its two beautiful bas reliefs representing Art and Labour, and its delicate white and gilt pinnacles seen against the blue sky, is a model piece of design for the occasion. For permanent architecture it would be too florid, certainly; but for a temporary façade for a festive occasion it is a quite ideal piece of design, and so are the two pavilions flanking the central avenue immediately inside the entrance. Then come an extensive range of buildings to contain exhibits of industrial art, among which is the pavilion of the Gobelins tapestry works, this and some others in the neighbourhood being embellished externally with large decorative paintings, representing processes of art industry. The northern portion of this range of buildings, however, on the west side especially, shows

again a good deal of that over-exuberance of detail which meets us everywhere on the Champ de Mars—finial features of enormous size, which look like small details magnified; colossal figures which reduce the scale of everything round them—and so on.

Coming to the new bridge, Pont Alexandre III., which connects the Esplanade with the Champs Elysées, we are again in the region of high art. The four pylons, as they may be termed, two of which mark the entrance to each end of the bridge, are features worthy of the best days of French Renaissance. They are masonry erections, with three-quarter-engaged columns at each angle, forming pedestals to carry each a gilded group of a horse and a nude figure, designed with great freedom and vigour. On the front of each pylon, on the side facing the approach to the bridge, is a seated figure carved in the same stone as the rest of the masonry. M. Gauquié's lamp standards along the parapet of the bridge look a great deal better in execution than they did in the drawings, and are very fine and rich pieces of metal design. The bridge is of a noble width. The one mistake in it is that the parapet and balusters, which are metal, are designed on the lines and in the proportions of stonework, the parapet formed of thin metal with a section giving it the proportions and appearance of a stone coping, though with a bronzed surface; and the balusters are hollow, of thin metal moulded to the usual outline of stone balusters. This is a mistake which we should not have expected from French artists. But in the main this bridge is an unquestionably fine piece of work.

North of the bridge we come to the two great art palaces, facing each other on each side of the new avenue leading to the bridge, and it may be at once said that no published illustrations give any adequate idea of the architectural dignity and beauty of these two buildings, their great scale, and the fine and striking character of their sculptural decorations. Even the one called relatively the "Petit Palais" is of immense size, and there is a harmony and finish in all the details of both buildings which it is delightful to contemplate, and which renders them truly an honour to modern French architecture. The only detail we should criticise is that all the exterior flights of steps are too steep in section—the risers too high, not only for convenience, but for effect, for one of the beauties of a flight of steps consists in its having an easy gradient, wide tread, and low risers; it is only on such lines that flights of steps can have their most dignified and monumental appearance, and this point seems to have been overlooked. Looking back from here, past the bridge and its pylons, through the long lines of white and gold exhibition buildings to where the familiar dome of the Invalides, in the far distance, closes the vista, the effect is something more striking than can well be realised till one has seen it.

Going eastwards to what is to be regarded as the principal portal to the exhibition, that opening from the Place de la Concorde, we may say here again that this design, of which we gave an illustration in our issue of August 12, 1899, looks better in reality than in drawings. The colouring is very effective, and like the entry opposite the Invalides, it is a model of temporary architecture for a holiday purpose. The large arches support a gilded dome, on which stands the piquant figure representing modern Paris, a lady in modern ultra-rich costume, in the attitude of welcoming visitors to the exhibition. We should perhaps have preferred a more idealised figure, and though the conception is original, the management seem to have the same feeling, for the figure is to be removed. On plan, the entrance wickets to the exhibition are very ingeniously arranged in a semicircle with its concave towards the entrance, the lines of entrance radiating from the centre of the circle; an arrangement both practically convenient and effective in appearance.

Taking one of the river steamers from the pier below the Pont d'Iena, and going up stream as far as the Pont de la Concorde, we have a remarkable spectacle in the succession of temporary structures which line the banks. On the north side the principal object of interest is the "Vieux Paris," a picturesque combination of imitations of feudal architecture, on a somewhat small scale it is true (the choir of a cathedral which finds place there looks as if it could be put into a hat-box), but conveying a good deal of the character of old Paris as we know it from old engravings. But the great spectacle is on the south side, where there is an unbroken range of buildings of all styles and outlines, commencing with the great globe erection (still unfinished), and showing a variety of architectural forms and styles, some of them, such as the Marine Building, representing the most modern French taste; many of them imitations of this and that form of ancient architecture, all of them well done and having, from the river, all the appearance of solid masonic structures. This stretch of the Seine has never been so picturesque before; and it is almost melancholy to see so much labour and talent expended on structures which must inevitably be removed before long, for they are only shams as far as construction goes. If they could remain it would be a spectacle worth keeping, but that is obviously impossible, and one feels a doubt whether the game is quite worth the candle.

Paris is completely, to use the expressive French word, "bouleversé" by the Exhibition; nothing else seems to be thought of; it has dominated the place; bridges and viaducts of communication stretch over the streets; the centre of the Place du Trocadéro, for instance, which is outside the Exhibition boundary, is all taken up by an immense panorama structure which hopes to reap a harvest by its proximity to the great show. The amount of money which has been spent in more or less direct relation to the Exhibition must be immense; for instance, on the high bank of the Seine, just beyond the Pont d'Iena, there is a group of four immense hotels erected in combination, the "Grands Hotels de Trocadéro," all erected in masonry of the usual solid and costly description, and barely finished—all to make their profit out of the visitors to the Exhibition. But whence are the profits to come afterwards for these and other large permanent buildings? It is to be feared that there will be something like a crisis in the market then.

When the Exhibition is really finished and filled, there is no doubt that it will be a kind of fairy scene of all kinds of delights. At present, in view of the fact that it is to be officially opened in a day or two, it is rather like a nightmare. To talk of "opening" it is in fact absurd; there is nothing to open, except the view of the outsides of the buildings. It will be finished eventually, no doubt, but in the meantime the month of May will have been lost, and we regret it exceedingly. It is a splendid effort, and we wished it to be a success. We will hope it may still be so in the end. But there is nothing more to be said about it for the present; the exterior appearance is all that can be taken into account, for some weeks to come.

ARCHITECTURAL DRAWINGS AT THE SALON.

THE temporary structure for this year's Salon has been formed on ground to west of the Place de Breteuil, formerly occupied by an abattoir, and which was apparently, for the moment, waste ground belonging to the Municipality of Paris. The Place de Breteuil, about half a mile south of the Hôtel des Invalides, is a very out-of-the-way site for the Salon, a fact which, in addition to the superior attractions of the great Exhibition, will probably tell heavily against its receipts this year. In spite of the large amount spent on the construction of the galleries (about 24,000*l.*), the Société des Artistes Français have not been able to achieve much more than the mere covering in of the site, and there is nothing of architectural embellishment except what can be attained by the use of bunting outside and tapestries and carpets hung on the walls inside. The *coup d'œil* of the interior is therefore a sad descent from the effect produced by the great central halls or gardens for sculpture which were contained both in the Palais de l'Industrie and in the Galerie des Machines. The Sculpture Court is first entered from the Place de Breteuil; it is a rather narrow court in the shape of the letter L; the visitor turns a corner to the left, and the long arm of the L leads up to the first compartment of the picture galleries. Turning again to the left, the visitor finds himself at the commencement of the long range of picture galleries, which are arranged in much the same way and are on the same scale as those to which we have been accustomed at the Palais de l'Industrie; a double row of rooms, interrupted at two points by a large square gallery nearly the whole width of the plan, with a narrow parallel gallery at each side, connecting the ranges of smaller galleries The galleries are covered by trussed roofs, beneath which is stretched a *velarium* of white canvas divided into squares of about a yard wide by narrow dark bands; whether these are merely decorative or whether the stuff is put together in these squares is not obvious; but the effect is quiet and satisfactory to the eye, and the light good except in dull weather, when it becomes deficient, and the difference in the effect of many of the pictures, as between a dull day and a fairly clear one, was very marked indeed. We have always found this to be the case in picture galleries where the light has to traverse a double screen—glass in the outer skylight for instance, and canvas or ground glass in the ceiling; as may be observed by comparing, at the National Gallery, the effect in the recently erected galleries which have a direct light from the roof, and those

in which there is a level glass ceiling below. It seems that with an overclouded sky the interior light, when it has to pass through both rooflights and ceiling lights, is obscured in much greater proportion than the obscuration of the external light. It takes a strong light to assert itself through a double screen.

The architectural rooms at the Salon open directly out of the first painting room, facing the entrance from the sculpture gallery, so that they are well in evidence. The number of drawings is less than usual, as they are confined to these three rooms, (each of them, however, at least twice as large as the architectural room at the Royal Academy), and there are no long galleries, as at the Palais de l'Industrie and the Galerie des Machines, along which to range a number of drawings not thought worthy of admission into the main galleries. This is no loss, however, for those furlongs of strainers in the galleries seldom included anything of great interest; and the architectural show has not suffered in character or interest from the restriction of wall space.

As we have observed before, the architectural drawings at the Salon differ in character from those of our own exhibition, in that the majority of them illustrate only ideas and *projets*, or restorations of antique architecture, while the majority of ours illustrate buildings erected or to be erected. The French drawings, in fact, indicate what the architects have been thinking of and aspiring after rather than what they have done; a fact in keeping with the artistic idealism of the French character. This year, however, there is a partial exception to the rule, as the exhibit which may be regarded as the central one consists of a very fine model and an equally fine set of drawings of the chapel in Rue Goujon erected in memory of the charity bazaar catastrophe, from the designs of M. Albert Guilbert, and which is now nearly completed. French architects never show better than in a work of this kind, which is for an ideal purpose and can be treated as an ideal conception. The elevation and plan of the design we published some time ago (*Builder*, July 30, 1898). The model gives all the details of the gates and other metal work and gilding, and shows the effect of the curved walls which project from the centre building and enclose the staircase to the main chapel; these walls contain niches with statues of much more than lifesize; a mistake in regard to effect of scale. The interior perspective and coloured sections, among the drawings which cover the wall in the rear of the model, give a complete representation of the appearance which the interior will present when all the decoration is completed. The main piers under the dome are composed of large coupled columns of a marble in which a light green hue predominates, contrasting with the smaller columns of a strong white and dark marking which carry the entablature of the exedræ in the intermediate spaces. On the entablatures over the main columns are seated the usual figures which occupy such positions in modern French architecture, and which have a decorative effect without much meaning. The cove in which stands the base of the dome is divided by double bands with guilloche ornament rising from the slices of entablature over the piers, and enclosing between them small figure subjects and other decoration. The manner in which these bands are rolled round into a scroll under the base of the dome is rather weak in effect. On the chord of the apse, in front of the altar, stands a colossal gilt figure of a "Vierge de la Consolation," with hands outstretched and a very pathetic expression of countenance; the figure is fine, but its immense and disproportionate scale spoils the architecture, though it is a kind of representation, of course, quite in accordance with Catholic habitudes in religious art. This figure contrasts rather oddly with the effect of the immense marble and gilded vases which stand between the columns of the main piers; like some of the rest of the decoration, these look exceedingly secular, and seem to belong to another world from the figure of the Virgin. In short, the attempt to give an abundantly rich effect to the interior has rather destroyed the solemnity which one would feel to be proper to a chapel commemorative of such a tragic incident. This again, however, may be less felt in a Catholic country, or among a Catholic community (for one can hardly call France a Catholic country now), where they are accustomed to rich and even gaudy interiors in places of worship designed on the Renaissance model. Externally there is nothing but praise to be given to the design, and the model and drawings, including studies and sketches for the sculpture and the figures in the windows, form one of the most interesting exhibits in architecture that we have seen for a good while.

Contrary to expectation, the California University competition designs are not much illustrated here, only two being exhibited, one of which, that of M. Despradelle, is a mere wild dream totally impossible of realisation, and in which even the plan, and the manner in which it is got up, partake of the sensational character of the perspective view. The other California design exhibited is that of MM. Bauhain & Barbaud, who come of a very good architectural genealogy, the former being pupil of M. André & M. Laloux, the latter of M. Ginain. In their design grandeur and extent are at all events governed by something like common sense. Their plan shows a garden with a centre avenue, the entrance to which is flanked by a theatre on one side and a circus on the other, placed diagonally, the curve of the auditorium of the one forming a feature nearly symmetrical with curve of the end of the circus on the other side. The avenue leads up to a main building, of which an immense coloured elevation is exhibited, showing it placed on a terrace with retaining walls of masonry treated in a massive and effective manner. A great flight of steps leads up to the centre portion, which is unfortunately crowned by that ugliest of features, a cupola square on plan and curved on section. The wings, which project far in front of the centre, have also their main feature in the centre, though with smaller pavilions at each end; an arcaded loggia runs along the ground story of the wings, between the pavilions, unfortunately rather coarse and lumpy in the details of columns and import, and in fact this is the defect of the design generally; as a whole it is dignified and sensible-looking, but the detail is commonplace and somewhat inelegant.

It is, perhaps, on account of the non-existence of the new Salon this year that we find here some examples of those mere architectural dreams which generally found place in the new Salon. The most pronounced of these, by M. Despradelle, is a conception for a vast monument—"Phare de Progrès," to the glory of the American people. The main elevation of this extraordinary conception is given in a drawing nearly twenty feet high, showing a great built-up obelisk rising from a platform, of which the surface slopes off like a *glacis*, and is decorated with a mosaic ornamental pavement. In front of the centre stands a smaller obelisk, carrying a figure of Liberty, at the sides still smaller ones; the attendant obelisks slope backwards slightly towards the centre one, which has an odd and rather unhappy effect. The platform stands on another platform curving outwards to the four angles, and finishing at each angle with a stone globe supported on four couchant lions. On the sides of this lower platform are a series of projections each bearing the names of eminent Americans, with a wreath at the top of each list. The perspective sketch shows the main obelisk soaring visibly into the clouds. As a project for execution it is of course absurd, but there is a sublimity in the conception which is undeniable. Another of these impossible but not uninteresting dreams is an extraordinary red drawing by M. Bigot, a pupil of M. Laloux, of "Un Calvaire," which takes the form of a rocky island connected with the coast by a causeway, on the high rock in the middle of which is sculptured in bas-relief a gigantic figure of Christ on the cross, in Byzantine style and on a ground of geometric patterns; a number of small round arched chapels are shown hollowed in lower portion of the rocks; this also is of course a mere vision but not without genius of a kind.

The collection includes, as usual, its great set of antique restoration drawings, in this case those of the Circus of Maxentius by M. Recoura. There is the usual curious contrast between the meagre indications in the drawings of the "Etat actuel" and the elaborate edifice raised on this slender foundation; but as an ideal study of a great piece of Roman architecture these are a splendid set of drawings, especially the elevation of the long side (interior) with its groups of statuary and the wall above the seat-ranges decorated with niches and statues, and the undulating line of hills and trees rising above it. It is a treat to see such beautiful drawing as this, and as a study it shows a great deal of insight into the character and detail of Roman architecture; and as no one wants in reality to restore the Circus of Maxentius, such a study is at all events profitable to its author and innocuous in any other sense. Among other studies of antique work are a fine set of drawings of the Temple of Victory at Athens*, including a very effective view showing the back of the temple, towards the Acropolis, with the prospect over the plain extending beyond it; a point of view of the building we have not seen illustrated before. Among other illustrations of ancient work may be mentioned M. Patouillard's water-colour drawings of various lots of Renaissance work; MM. Gromort and Leclerc's finely-executed elevation of the basilica at Vicenza, accompanied by a detail elevation of one bay to one-tenth the actual scale, which is a marvel of solid and effec-

* We did not get the author's name; the numbers had not been affixed to the drawings, and where they were not legibly signed there was no clue to them.

tive drawing and shading; M. Deneux' interesting measured drawings of the chevet and flèche over it at Reims, showing all the details of the carpentry—it is curious to observe how the upright pieces in tension are continued into the air far below the tie-beam, as if to get plenty of stuff to hold by, or else because it was waste of labour to cut the ends off; M. Grellet's excellent set of small pencil sketches of cathedrals, 'Croquis Archéologiques dans l'Ouest de la France," obviously finished on the spot, and exactly what such sketches ought to be; M. Radel's plan and elevations of the very curious "Maison des Viguiers" at Albi—the very flat three-centred arches in one of the interiors, broken at the centre by three immense projecting voussoirs (the rest of the arch being plain), form a most characteristic feature; also the naïve appearance of the two sculptured heads of a man and woman (evidently the owner of the house) in two niches beneath one of the windows, the niches not being treated symmetrically, but one of them higher than the other, each fitting the size of the head. A more curious bit of building one has seldom seen illustrated. We should also mention a very fine water-colour, the size of the original, of a mosaic head of Minerva in the Vatican Museum, which, as a piece of Roman work, is remarkable for its boldness and freedom of design and execution.

Among designs which may be called ideal, because they are such as are never likely to be executed, is M. Wable's design for an Oriental museum, of course a study in the application of Oriental detail to a Western building, concerning which we may say that "for those who like that sort of thing, it is just the sort of thing they would like." M. Rives's "Façade d'un Palais d'Exposition" may be taken to be a kind of advertisement, representing an exhibition building of such size and elaboration of design as never would be carried out, but as a piece of architectural drawing it is a triumph; even the way the small scale sculptures are put in is a study in itself. This is a kind of drawing it is worth a man's while to make once in a way, perhaps, to "show his hand;" beyond that it is time wasted. We do not make out whether M. Narjoux' "Projet pour la Maison du Peuple" is intended for any particular site and for actual execution or not—it is not impossible of execution, however, and is an imposing conception with a separate and well designed monument as a central object in front of the building; unfortunately the dome is a mistake, being treated with masonry of unusually massive details in the lower part, the upper portion consisting of a peaked glass circular skylight which contrasts wretchedly with the solid masonry. There cannot be a greater mistake than to make a glass dome on a masonry substructure, or a masonry dome with so much glass that it appears (as in this case) to be an integral part of the dome; by either expedient all monumental character is destroyed at once.

As usual, there are not many drawings representing current work, nor are most of them very interesting. One may notice with satisfaction that the "spiky" type of French villa is less conspicuous than usual, and there is even one design for a powerfully treated masonry villa, with an exceedingly bold cornice, and altogether an unusual piece of house architecture, rather spoiled by the two very tall and thin chimney shafts at one side, which serve to announce to the world that the owner (or his architect) was at least determined that the sitting-room fires should not smoke. There is a new Hôtel de Ville for Tunis, by M. Woog, which with its two loggias, white surfaces and green roofs, has a sufficiently southern climate appearance, enhanced by the deep blue sky liberally laid on by the artist. But there is one modern design which is of rather special interest, as it is the design, by M. Rabier, which gained the gold medal in the recent competition for the best Paris street front; it represents a house in the Boulevard de la Villette. The general effect is pretty good, the numerous balcony railings are well treated, but the large projections appearing to hang from the upper portion of the building and stopping with a heavy lumpy termination above the first floor level, are very unsightly; and if this was the best the competition could produce, the conclusion would be that the best class of domestic architects in Paris did not compete. In the plan we observe that the kitchen and water-closet open out of the same small lobby, the doors close together, and the water-closet without any external opening whatever. The French seem to be very slow in making any improvement in these matters, or even in finding out where they are wrong.

There are a good many interesting drawings of ancient work which we have not had space to mention, and these are a portion of the collection which would probably be of most interest to English visitors; the French take such pains in these delineations, and produce such beautiful drawings, that they are really of value for the study of ancient work. At the same time we think it is much to be regretted that the Salon architecture does not show more illustration of the current architecture of the day.

NOTES.

The Union of Benefices Acts, London.

A PARLIAMENTARY Bill has been prepared by the two Houses of the Convocation of Canterbury for the purpose of extending to the whole of England and Wales the scope of the Acts of 1860, 1890, and 1898, which now apply to London only. The present Acts provide that no union of benefices shall be effected and no church shall be demolished without the consent of the vestries and the parishioners who are concerned in the union proposed. From some memoranda and statistics drawn up for the City Churches Preservation Society, it appears that so far a sum of nearly 320,000*l.* has been obtained from the sale of the sites of certain churches within the City, whilst out of that sum 188,000*l.* was appropriated to the establishment of new churches in remoter districts; thus a large balance remains in the hands of, we presume, the Commissioners. It is not commonly known that a clause in the Act of 1860 (23-4 Vict., c. 142) especially exempts four churches in the City from liability to demolition under that statute—they are the churches of St. Stephen, Walbrook, St. Martin, Ludgate-hill, St. Peter, Cornhill, and St. Swithin, Cannon-street.

The Railway Accidents Bill.

THIS measure has, after all, passed the second reading before the Easter recess, and will, in due course, be considered by the Standing Committee on Trade. It was evidently recognised that it would be a mistake to shelve the Bill—a fate which, at one time, seemed very likely indeed to befall it. As we anticipated, there was little or no opposition at this stage, members who hold very diverse views uniting with one consent in favourable comment—to the evident gratification of the author of the measure, Mr. Ritchie. The omission of "the blessed word, automatic coupling"—as one member phrased it—was naturally remarked; but it was explained that the question is undoubtedly covered by the Bill. It was generally agreed that it was a useful and comprehensive measure, going as far as it is safe to go at present. If passed in its present form, the measure of its usefulness will be determined by the extent to which the Board of Trade exercise the powers it confers upon them.

The Patent Laws.

WE have received a pamphlet on "Our Patent Laws," by Mr. James Keith, C.E., which was written some years ago, but is republished with revisions in view of the investigations of the Departmental Committee recently appointed to consider the suggestions which have been made for developing the benefits of the Patent Office. The points made by Mr. Keith are interesting and valuable. The Government should do its best to encourage inventors; it should not regard the Patent Office so much as a source of revenue; it should bear in mind the importance of creating new methods and machinery for the purposes of international trade competition. We cannot, however, agree with Mr. Keith in his view that the ingenuity of patentees in the United States depends so much on the patent laws. There is far more general ingenuity, a far greater nimbleness of mind, among the people of that country than on this side of the Atlantic; there is a general eagerness for short cuts, for improvements; and even with a less perfect system of patent laws there would be more inventions in the United States than in Great Britain. But that is all the more reason why the State should foster invention as much as possible in this country.

The Effect of Water on Asphalt.

VERY little information has hitherto been generally available as to the action of water upon asphalt. The matter is important, especially with regard to the linings of reservoirs, and we are therefore pleased to observe that an account of some experiments on the subject has recently been communicated to the Brooklyn Engineers' Club, New York. Three modes of examination were adopted during the course of the investigations, which extended over a period of about two years. In tests of the first class, samples of asphalt were placed in glass jars filled up with water, and changes in the chemical constitution of the water were determined by analysis, so that the nature of the soluble constituents of the material might be ascertained. In tests of the second class, attention was chiefly directed to the observance of alteration in weight after immersion, and in the third class physical condition formed the subject of inquiry. Some brands of asphalt became softened on the surface, which was penetrated to the depth of about 1·2 millimètres after the lapse of two years, and the colour changed from black to brown. Experiments of the third class showed that the amount of soluble matter in the water above

the asphalt corresponded approximately with the intensity of action observed in tests of the first class. An increase of weight was in every case noticed after immersion. Generally it was found that water containing the smallest percentage of mineral matters in solution produced the greatest effect, and that salt water had very little if any action on the material. So far, the assumption is that the effect of water upon asphalt is largely due to oxidation, and the result is a serious diminution of quality.

Great Increase in the Price of Gas.

THE Commercial Gas Company and the South Metropolitan Gas Company, of London, have both notified that large increases are to be made in their gas charges; the former making an immediate rise of 6d. per 1,000 cubic feet, and the latter of 3d. per 1,000 cubic feet. The great increase in the price of coal will probably necessitate a general rise in gas prices in many parts of the kingdom, and will doubtless result in the admixture of even larger proportions of carburetted water-gas with the coal-gas than are already employed. Having regard to the fact that carburetted water-gas has a lower heating value and a higher specific gravity than coal-gas of the same illuminating power, we may again draw attention to the desirability of introducing a heating power test in the series of tests carried out by the official gas examiners, and to the fact that gas appliances adapted to burn coal-gas are not fitted to burn the heavier gas unless it be supplied to the burners under a greater pressure.

Urban Districts of Bilston and Coseley.

ACCORDING to Dr. Mair's Report to the Local Government Board upon the sanitary circumstances and administration of the Urban Districts of Bilston and Coseley, and upon a prevalence of enteric fever therein, the district of Bilston is not in so bad a state in regard to sanitary arrangements as we too often find recorded in these Reports. The state of the dwellings (mostly occupied by the working class) seems to be the worst point: we are told that many houses in the district are in a state of more or less advanced decay, and in several streets and alleys it was uncommon to see houses with any provision for the removal of rain water, and it was still more uncommon to see a house anywhere in the district without some evidence of the escape of rain water upon the outside walls from the pipes when such had been provided. This is very bad, of course, but in regard to excrement and refuse disposal we find that at Bilston the privies are mostly provided with movable receptacles, and the Council employ a contractor to remove refuse matter from privies and ashpits, who is paid 800*l.* per annum for this work, which has to be carried out entirely under the orders and directions of the Inspector of Nuisances. Every morning the contractor receives instructions from this official as to the houses to be visited on the succeeding day, and he is obliged to make a daily return of the number of privies and ashpits emptied by his men. All refuse removed belongs to the contractor, but he is forbidden to deposit it anywhere within the district without the express sanction of the Council. All this is satisfactory; nor does the sewage system seem to be as defective as in many country neighbourhoods. The district of Coseley has a worse record. Dwellings are damp and with unpaved yards; and there seems to be no system whatever of excrement disposal; "ashpits were said to be emptied once in three months," but there was evidence that even this was very imperfectly done. There are but few sewers in the district; the drainage of inhabited places is mostly dependent upon the natural facilities which exist for surface drainage. Sewage and domestic slops find their way from back yards into the roadside channels, where such exist, and, where they do not exist, flow or lodge anywhere that the inclination of the surface may determine. Hence there are nuisances in many parts of the district arising from open channels and ditches along which sewage matters pass, or in which they lodge or stagnate. No attempt is made to purify the sewage collected by sewers, where such exist; they all discharge into ditches, brooks, or into the Birmingham canal. The Staffordshire County Council have, since their formation, repeatedly pressed the Coseley District Council to provide a comprehensive sewage scheme for their district; but apparently to no purpose.

St. John the Baptist Church, Clerkenwell.

At a sitting of the Consistory Court of London, held in St. Paul's Cathedral on Thursday last week, Dr. Tristram, Q.C., Chancellor of the Diocese, granted a faculty authorising alterations in the crypt of the church. It is proposed to construct a flight of steps which shall afford entrance into the crypt from the west end of the present church, which was built in 1722-3 on the site, in part, of the choir and chancel of the ancient priory church (consecrated in 1185), and to stop up the present entrance (at the crypt's east end) from the disused burial ground. The improvements, to include the laying of the floor with tiles, will cost about 1,400*l.* towards which the Ecclesiastical Commissioners give 400*l.* out of the City Parochial Charities Fund—the remaining amount will, it is expected, be voluntarily subscribed. A description of the crypt and its constructional features is given in our "Note" of July 30, 1887.*

Italian Onyx Marble.

ARCHITECTS who have visited the Cathedral of Siena must have been struck by the peculiarity of the marble employed in the six altars in the lateral aisles, and particularly by that forming the large columns standing two by two at the sides of these altars. This marble is well known to Italian geologists as travertine, a material deposited chiefly from hot springs, and made almost entirely of the mineral aragonite; but until recently there was but little clue to the locality whence the stone came. Amongst the many varieties of marble dug up during excavations from time to time in the forum at Rome were to be found occasional examples of this same marble seen in Siena Cathedral. It occurs sparingly in ancient churches in other parts of Italy, and we have seen what looks very much like it in small panels in St. Peter's at Rome. Similar marble coming principally from Algeria and Mexico is known as onyx in the market. It is not true onyx, however, though we should be sorry to discard the latter name when used in a commercial sense. The Italian name, *alabastrite*, is unfortunate as applied to any of these marbles, as it is likely to be confounded with alabaster; neither do we think the terms Oriental alabaster or calcareous alabaster desirable for the same reason. Some two or three years since, onyx similar to that in the Siena Cathedral was discovered on the hill slopes in the neighbourhood of Monte Amiata, in Tuscany, and further exploration revealed the circumstance that by the side of a mountain torrent there, some ancient quarries exist. In all probability the columns at Siena came from those quarries some 400 years since. We learn that these excavations have now been reopened, and the material is called Italian onyx marble.

* For further particulars, and illustrations, we may refer our readers to the *Builder* of October 7, 1854, July 1, 1876, November 28, 1885, and February 22, 1890.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

THE LAW AS TO ANCIENT LIGHTS.

A SPECIAL meeting of the Royal Institute of British Architects was held at 9, Conduit-street, W., on Monday evening, for the purpose of discussing the papers read at the ordinary meeting on the 19th inst. on "Ancient Lights."* Mr. W. Emerson, President, presided.

Mr. Alexander Graham, the Hon. Secretary, announced with great regret the death since the last meeting of Signor Michele Ruggiero, who was a hon. corresponding member (Rome, elected 1887). He was Director for Monuments and Excavations in the Kingdom of Italy, and member of the Royal Academy of Naples.

The meeting directed the Secretary to transmit the condolences of the Institute to Signor Ruggiero's relatives.

The Chairman then introduced the business of the evening. He said the question was a very important one, and, as was shown at the last meeting, the laws relating to ancient lights had in the past been the means of most unscrupulous behaviour on the part of many people, and had caused a great deal of blackmailing and injustice. There could be little doubt that the time had arrived when strenuous exertions should be made to endeavour to obtain some alteration in those laws, and he hoped that those who proposed to take part in the discussion would bear this in mind, and would suggest some practical points in the event of some action being taken. It would be a good plan to form a committee composed of two or three members of the Institute, two or three members of the Surveyors' Institution, and two or three lawyers to provide a Bill or some suggestions to the Government.

The Chairman then read a letter from Mr. Thos. W. Rickman, President of the Surveyors' Institution, in which that gentleman expressed his regret that his doctor refused him permission to come out that evening. He felt strongly, in the words of Mr. Fletcher Moulton, that "the rule that existing rights shall not be interfered with is too drastic to be adhered to;" also that the presumption of law in favour of existing dominant lights was contrary to common sense. But these were only his private opinions. Should Mr. Brodie's resolution be carried, he would be most happy to do all in his power to bring the Council and the Surveyors' Institution into touch with the Council or Standing Committee, so as to obtain a combined discussion of the whole subject.

Mr. W. J. Locke, Secretary, then read the following communication on the subject received from Mr. Arthur Cates:—

"Every one interested in the establishment of right and justice, and in the abolition of the tyranny and blackmailing, perpetrated under the sanction of the present law of light as administered in the Courts, must be grateful to the Practice Standing Committee for having brought the subject again before the Institute, and for having introduced its discussion by the three able Papers read on the 19th ult. For many years at intermittent intervals the subject has been considered and discussed here, resulting in the publication in the Proceedings and Transactions of a large amount of valuable matter, which might now be collected and, so

* Papers by Messrs. J. Fletcher Moulton, Q.C., M.P., J. Douglass Mathews and Beresford Pite. For abstracts of the papers, and for some notes of the discussion on them, see our issue for March 24.

far as it may bear on the reform of the existing law, be republished as a convenient handbook for the information and assistance of those who may desire to follow up this discussion to some practical conclusion.

The discussion on the Paper on 'The Law of Easements,' read by Mr. Locock Webb, Q.C., on December 17, 1877—Transactions, 1877-78, pp. 88-112—elicited an article entitled 'The So-called Law of Ancient Window Lights,' which appeared in the *Builder* of January 26, 1878. This article, which was quoted at some length by Mr. John Whichcord in his preliminary statement—Special Committee on Light and Air—Proceedings, Session 1881-82, No. 18, July 27, 1882, p. 236, was written with great care, and, combining the results of a special study of the subject and of a somewhat extensive professional experience, strongly advocated a complete reform of the existing law.

Another article, 'Reversions and the Acquisition of Rights of Light,' which appeared in the *Builder* of January 12, 1884, dealt with a position of great difficulty, under which the most onerous dominant rights frequently grow up. Both these articles would be most valuable, to be included with the suggested reprint of excerpts from our Proceedings, &c.

Assuming that the resolution which Mr. C. H. Brodie proposes to submit to the meeting will be adopted, it would appear to be desirable that no attempt should be made to devise some scheme for merely diminishing the evils which, it is admitted, the existing law as now administered permits and encourages, thus to a great extent accepting the present state of the law as equitable and correct—but rather, the endeavour should be made *inter alia* :—

To investigate the principles on which it is alleged that such law is based.

To ascertain the reasons which influenced the Legislature in enacting the particular clause under the alleged authority of which so much extortion is practised and hardship inflicted.

To illustrate the mischievous and unjust action of the law, and the opportunities it affords for oppression and extortion, and thus give good reason for the pressing necessity for a radical change.

To inquire into the law of other countries on the subject.

As regards rights of light which are manifestly encroachments on the servient tenement, to consider how such servient owner could be protected, by the really equitable and just system in force in Scotland, or otherwise, from the aggression of his neighbour—the real evildoer and first aggressor, the dominant owner.

In addition to the references given by Mr. Brodie in his memorandum on pp. 234-235, *ante*, much useful information in the directions above indicated will be found. My remarks in the discussion on the law of light and air—Proceedings, Session 1880-81, No. 13, March 17, 1881, pp. 188-191—contain much information as to actual experience: regulations controlling the height of buildings in relation to the width of streets, the French law, the Scotch law, &c., generally pointing to the necessity for a reform of the law; which will be of service in the consideration of the matter, but would occupy too much time to recapitulate here.

The special committee appointed after the above-mentioned discussion requested Mr. J. Leybourn Goddard (author of 'The Law of Easements') to report on the law respecting light and air as it existed previously to the passing of the Prescription Act, and to show how the law of prescription grew up before that Act was passed, what were the reasons for the passing of that Act, how that Act was brought in and passed through Parliament, and how the law regarding light and air was affected thereby. Mr. Goddard's Report was printed in the Proceedings, 1881-82, 11th May, 1882, pp. 254-267, and clearly shows how little consideration was given to the question of light. The Prescription Act was the first result of the labours of the Royal Commission on the Law of Real Property, and on p. 263 Mr. Goddard sets out the few words in which this most important subject was summarily dealt with by Lord Tenterden—without explanation or qualification—and thus became law without apparently any discussion or amendment in either House.

Mr. Edward Stanley Roscoe—who was associated with me on that Committee, also carefully examined the Report of the Royal Commission and the evidence on which it was based, but did not find that the question of the right to light was specially discussed either by the Commissioners or the witnesses; and it seemed to him to follow that, as the question was not discussed in Parliament, the Act was passed, so far as regards the right to light, without there being any reason for it, and without any consideration of its probable consequences; and there appeared to him no reason why the mere fact of such a measure being in the Statute Book should be any argument against its repeal, having regard to the circumstances under which it became law. Mr. Roscoe's observations will be found in Proceedings, Session 1882-83, No. 15, May 31, 1883, p. 143, and No. 16, June 14, 1883, p. 154.

In the Proceedings, Session 1882-83, No. 10, March 8, 1883, p. 96, there is a communication on the subject from the Manchester Society of Architects, in which they say: 'The simple gaining of an easement of light over an adjoining property, by lapse of time only, this Council does not consider justifiable, and it would be glad to see the law altered. The system of gaining an advantage surreptitiously is not in accordance with the views of morality held by the Council of this Society.'

In the 'Journal of Proceedings,' Vol. 2 N.S., No. 19, August 12, 1886, pp. 281-285, are 'Reports on the Law of Light and Air in Scotland,' contributed by William and C. J. MacLean for the Glasgow Institute of Architects—and by the Edinburgh Architectural Association.

The latter report thus summarises the law: 'In Scotland such servitude is regulated by express grant or contract, and cannot be constituted by prescription. In the law of Scotland, light and prospect is a negative servitude, *i.e.*, a servitude in virtue of which a servient proprietor is prohibited from performing some act which, but for the servitude, he would be entitled to perform. A negative servitude can only be constituted by a grant. It does not admit of possession, and therefore cannot be acquired by prescription.'

Personally I am very pleased to have been able to bring this just and equitable view of the law to operate in a limited extent in London; when, some thirty years ago, consulted by the Commissioners of H.M. Woods in charge of the estates of the Land Revenues of the Crown in London, with reference to the management of those estates, I advised that, in order to put a stop to scandalous litigation between the Crown tenants, resulting in blackmail or the crippling and cutting down of buildings and hampering the development of the estate, all future leases should contain a proviso taking away from the lessee all right of light over adjacent Crown lands. This recommendation was adopted, and such proviso has since been invariably inserted in every new lease; shortly afterwards, this came incidentally under the notice of the Master of the Rolls (Sir George Jessel) and was warmly approved by him. The proviso is as follows:—

'Provided lastly: and it is hereby further agreed and declared and this demise is made upon the express condition that the said lessee his executors administrators and assigns shall not by virtue or in respect of this present demise be deemed to have acquired or to be entitled to neither shall he or they during the existence of the term hereby granted acquire or become entitled to by length of enjoyment prescription or by any other means whatsoever in respect of the premises hereby demised any right of air or light or other easement from or over or affecting any land or hereditaments belonging to her Majesty not comprised in this demise but on the contrary it is agreed and declared and the said lessee doth hereby covenant and grant with and to her Majesty her heirs and successors that it shall be lawful for her Majesty her heirs and successors and for the said Commissioner or Commissioners and her his and their grantees lessees or tenants at all times hereafter to erect any new buildings of any height on any land belonging to her Majesty not included in this demise and to raise to any height or alter any buildings now existing or to be hereafter erected on any such land as last aforesaid whether any such buildings or alterations as aforesaid may or may not prevent obstruct or affect the passage of air or light to the premises hereby demised or any part thereof or to any new building which may hereafter be erected on the land hereby demised.'

This proviso has worked admirably; litigation has been prevented, the development of the estate has not been impeded by rapacious or cantankerous owners of dominant rights, the rents obtained have not been affected, and no one has been injured by its operation.

Thus in course of time, when existing terms have run out and the proviso will under the new leases have become applicable to the whole estate—the Crown estates in London will by the operation of that proviso—and the effect of the decisions of the High Court in Perry *v.* Eames* and in Wheaton *v.* Maple†, be placed much in the same position as if under the law in force in Scotland, and be entirely outside the operation of Section III. of the Prescription Act.

The efficient municipal control of buildings generally—of the width of streets, of the height of buildings, of the open spaces in the rear of buildings, and the sanitary enactments as to provision of due access of light and air—should amply suffice to meet the requirements of the Roman law under the servitude of '*Altius non tollendi*.' And to protect all alike, in the interests of public health, from those encroachments by bold and unscrupulous speculators, who are now to some degree held in check by the operation of the existing law, and who certainly require to be more rigidly controlled than seems possible under the building laws at present in force.

Every endeavour must be made to dispel the prevailing idea that the wrongdoer and offender is the owner of the servient tenement, who, by building on his own land, takes away from the dominant tenement something for which the owner thereof has given no consideration, and has acquired in such a manner, that the unhappy owner of the servient tenement has had no power of protecting himself from the acquisition of a right over his land, seriously affecting its value and controlling its user by him, to the advantage of a stranger who benefits without payment by the increased value of his land derived from the rights he has so acquired over his neighbour.

No mere palliation of the wrongs now inflicted on the servient owner for the advantage and benefit of the real evildoer and first aggressor, the dominant owner, should be attempted, but the aim should be to establish as a principle that no indefeasible right to light should be allowed to be gained by mere efluxion of time, or otherwise than by an express contract between the owners of the dominant and servient tenements."

Mr. C. H. Brodie, Hon. Secretary of the Practice Sub-Committee, said his position on this occasion was purely an official one. It was known, perhaps, to most of those present, that the meeting of which this discussion was a continuation was originated by the Practice Sub-Committee of the Institute. The subject was considered a very important one, and the committee were luckily able to secure excellent papers by Mr. Fletcher Moulton, Q.C., Mr. J. Douglass Mathews, and Mr. Beresford Pite, which had been published. The committee, in considering the subject, came to the conclusion that the law as it stood was pressingly in need of alteration, and in the result a resolution was drawn up by them. The resolution, which he desired to move, was as follows:—

"That this meeting considers an alteration in the law of ancient lights to be urgently needed, and requests the Council to put itself into communication with the Council of the Surveyors' Institution without delay, with a view to the co-operation of that body in taking such steps as may be necessary to secure an amendment."

The subject, he said, was certainly one of pressing importance. It had been shown in the papers referred to that such prescribed rights of lights as were allowed to accrue in England were not so allowed to accrue in Scotland, Sweden, France, and the United States. Then why, he asked, should they be allowed to accrue here, when they were so harmful in their effects? He would not be accused of overstating the case if he quoted from remarks which had been made on this subject, and which bore out the view of his committee. Mr. Fletcher Moulton, in the early part of his paper, said: "The question of law reform in this respect is one of immediate and pressing importance." Then later he said: "Our courts are often practical at the cost of logical consistency, and their behaviour in this respect shows that they have realised the fact that the absolute rule that existing rights shall not be interfered with is too drastic to be adhered to under the needs of a rapidly-increasing town population."

* "Journal of Proceedings." Vol. VII. N.S. No. 12, April 9, 1891, pp. 257-60.
† *Ibid.* Vol. IX. N.S. No. 19, August 24, 1893, pp. 487-8.

Further on he said that "the strict rights of light given by the Prescription Act are very onerous, and often very injurious to the proper development of our towns." Any one who had followed the subject must be absolutely convinced of that. Then, speaking of neighbours, Mr. Fletcher Moulton continued: "His light must not be interfered with, however great the inconvenience to his (building) neighbour, and however little the injury to him, if it be more than infinitesimal. Too often such a state of things leads to what is nothing less than levying blackmail on the building owner. He must pay what is demanded or abandon his scheme." Was that the position in which they should be content to rest? Mr. Mathews said that of course it was only the bad cases which made the law so oppressive, and he added "As matters now stand an unscrupulous person has an opportunity of preventing his neighbours from using his property to the best advantage, except by payment of some compensation (oftentimes blackmail), and the law affords us no means otherwise than by mutual agreement to alter old lights in a way that may be beneficial alike to the owner of the dominant light and to the person erecting his new building." Mr. Mathews also called attention to the fact that this Prescription Act was passed nearly seventy years ago, and what was perfectly reasonable then had become very unreasonable now. Mr. Pite's paper was a collection of brilliant points against the law as it at present stood, and the way in which it had been administered. Again, in 1890, Mr. Holden remarked:—"The obtaining of an easement by prescription is, in my opinion, a simple piece of dishonesty." In 1889 Professor Kerr said:—"The inconvenience that arises in London from the practical application of the law of ancient lights is indescribable . . . . and the trouble into which neighbours get, and the hallucinations under which they labour as regards their rights to blackmail each other, are remarkable." Again in 1889, Mr. Stevenson stated that the law as affecting the right of ancient lights acted "in a perfectly haphazard and irregular manner depending on mere accident, and consisting in stealing a neighbour's property if he does not look out, at cost and trouble to himself to prevent it." In 1877 Mr. T. Chatfeild Clarke remarked:—"So many opportunities are now afforded for litigation, when the effort is often one merely to exhort money, that a remedy is urgently demanded." As far back as 1866 Professor Kerr made some remarks on this subject, and he quoted the opinions of two Lord Chancellors (Lord Westbury and Lord Cranworth), and stated that they did not hesitate to deplore the effect of the decisions they were pronouncing, and to suggest that the time had possibly come for the Legislature to interfere. If that time had come in 1866, how much more was the alteration needed now! In his (Mr. Brodie's) opinion, the Act which they should strive to obtain should consist of two operative clauses. The first should stipulate that after a certain date the Prescription Act, as such, should cease to exist. Of course, ancient lights having existed, must be respected, but after a certain date the Prescription Act should be allowed to lapse. Clause 2 should apply to actions over lights the procedure incidental to the Building Act with reference to party-walls. That procedure had been found to act perfectly well, and there were strong grounds for believing that it would act equally well with reference to actions over rights of light. He wished to give quotations in support of his contention. When the discussion took place on March 16, 1893, upon the Science Committee's report, Professor Kerr, in clear and distinct terms, laid down the principle which he had just stated, and that committee proposed that the procedure of the Building Act with regard to party-walls would be an excellent method of dealing with cases of ancient light. In conclusion, Mr. Brodie said the desirability of amending the law was impressed upon his mind forcibly by a recent case in which a Turkish bath was erected facing a chapel and upon the site of an old city prison wall. At the opening ceremony of the bath, the chairman remarked that he understood that some objection had been made that the structure interfered with the light to the schoolroom beneath the chapel, and he was surprised that religious people should interfere with a bath, because he always thought that cleanliness should be next to godliness. Legal proceedings followed, and it was held that the building did interfere with the light to the schoolroom windows, and therefore it must be cut down to an angle of 45 deg. As a result, the baths were closed. That was an instance of the general way in which light and air cases were drifted into. The question of interference with light was not the point—there was always some question of spite or greed or something similar at the bottom of it.

Professor T. Roger Smith seconded the resolution. He said they were all agreed that it would be very easy to illustrate the hardships and injustice that occurred from time to time, and there could be no question that the only remedy was legislation. They must recollect that judges were bound hand and foot by precedent. No man in the position of a judge dared to do anything which was contrary to precedent, and consequently he did not think that judges would exert themselves to alter precedent or to make it less irksome. He thought that the Institute, in promoting an Act, would find it could rely upon the cordial assistance, not only of the Surveyors' Institution, but of Builders' societies, and probably of almost all the great landowners in London and no doubt several large owners of property. They could also, to an extent, rely upon the assistance of the lawyers in Parliament. Mr. Moulton and Mr. Strahan both suggested modifications in the operations of the existing law, and no doubt, as far as they could, they would assist in securing them. A very desirable reform in procedure would be the allowance of compensating advantages. At the present time they were entirely shut out from courts of law. In some instances, arbitrators could not avoid taking them into consideration, but they had no right to do so, and therefore compensating advantages only indirectly influenced awards. A compensating advantage mentioned more than once was the use of white bricks of reflecting surface. There were one or two other compensating advantages which ought always to be considered. First was the removal, to some extent, of obstacles. It often happened in a building scheme that something was going to be taken down which would give additional light and would nearly compensate for the obstruction of light which was going to take place. Under the existing administration of the law this could not be taken into account. What they ought to do, he thought, was to substitute for the present system what was known as the party wall procedure, which practically put a stop to litigation. If any one would consider how many houses were taken down and rebuilt in London in the course of a year, and then take the trouble to find out how many party wall cases went to the courts for decision, they would see that this procedure disposed, to a very large extent, of the difficulties which arose in a way that was just, equitable, and prompt. Now whether their friends the lawyers would quite like this system of dealing with the rights of light, he did not know. Perhaps they would not. One objection was made to it—he thought it was in Mr. Pite's paper—that the nature of an ancient light was so very different from that of a party wall that it could not be adjudicated upon in the same way; but he doubted that very much. He had some little experience of settling disputes with regard to ancient lights, and it struck him that there was no great difference in the amount of difficulty which arose in connexion with them and party walls. The one feature which pervaded both questions was the variety of circumstances which were peculiar to each. Ancient lights were infinitely varied, and he was of opinion that the same amount of care and intelligence that was exercised in the settlement of party wall disputes should also decide ancient lights, probably with equal success. Then in the recommendations of the Committee there was a proposal for an experts' tribunal. He could not help thinking that it would be quite feasible to refer cases of ancient lights to that tribunal, whose members he considered excellently qualified to deal with them. The author of the last book on ancient lights sat at the tribunal, and if they could not dispose of any difficulties in a satisfactory manner, he did not know any who could. Then the last, and most important, point was that they ought to go in for the entire abolition of the acquisition of the rights of ancient lights for the future by enacting that in no case should ancient lights be recognised which were not in existence on the date when the Act passed. He hoped this point would be kept in view. As far as possible they should endeavour to remedy the existing mode of dealing with ancient lights. He had great pleasure in seconding the resolution.

Mr. E. T. Hall said they must all be infinitely obliged to the Committee for bringing this important subject before them at that stage. They had a little leisure now to take up subjects which a few years ago they had not the opportunity of doing. The President had asked them to deal with the matter from the practical point of view, and he should endeavour in the few remarks he had to make to offer some suggestions which resulted from his experience and his consideration of the subject. He should like at the outset to clear the ground by referring to one or two things which Mr. Brodie had touched upon. That gentleman had remarked that every man should be compelled to light his own property within the curtilage of that property, but he had to remind them that this was hardly possible in crowded places like London. They must not forget one or two things in dealing with a subject of this kind. One of these was that the Law of Prescription had been held in the law courts to be an essential law in order to prevent great friction and great litigation, and they must remember that the Law of Prescription had very often been used for the purpose of getting public rights as against an individual owner who had been held to hold this land on condition that he did not obstruct the public convenience. In that way, almost all the rights of way they found in the country had been acquired, and no one would say that the law of prescription which had given them footpaths over vast estates, without which they might require to go in a very round-about way to reach a place, should be done away with. In like manner, water rights were most important, and he had no doubt it was the consideration of such things as these which led the Legislature to say that there should be a prescriptive right with regard to lights. They must also remember, in speaking of footways, that the same principle had been held in respect to railways. No person, simply because he was the owner of land, could prevent a railway which was for the public convenience, passing through his property, and accordingly the Legislature passed bills which were greatly to the convenience of the public. Now it was equally in the public interest that buildings should be allowed to be increased in height and, therefore, the Legislature which gave the public by prescription the right of a roadway through a property also said that it would not recognise the right of an owner to interfere with the public convenience by refusing permission to raise the height of a building. Originally the buildings in London were of one story, but as land increased in value and large numbers of people congregated within a limited area those high buildings had to go up. Now, from a public and sanitary point of view, the power given in certain cases of preventing overcrowding in a building was a good power, and if there were not some restriction with regard to lights they might find that all sanitary considerations in regard to light permeating through and around buildings would be done away with. He also thought that if a man, in developing a building estate that had formerly been agricultural land, approved of the plans of a building to be erected on ground for which he would receive a large ground rent, he should not be allowed to permit the erection on adjoining land of a building which would obstruct the light of the windows which he allowed to exist in the house first erected. In such a case he held that there should be a certain space reserved for lighting purposes. He would submit as a practical suggestion that when an ancient light had been acquired by real lapse of time, say at a distance exceeding 10 ft. from a fence, the adjacent owner should at the same distance from the fence have the right to build to the same height. That would get rid of the dominant right over the adjacent land. No injustice would be done to the first man, and they would obtain a good amount of light and air between the two buildings. If the fence was nearer than 10 ft. the dominant owner, he thought, should pay during twenty years—that was to say, the time in which he would otherwise acquire the right—to the serviant owner a rent to protect his rights, which rent should be equivalent in value to what he might expect to get as compensation for the injury of that light if he acquired it by mere lapse of time. If he did not pay this rent, then he should not be allowed to acquire the right. Then another suggestion he had to make was that the owner of a low building on

one side of a road should be allowed to go to the same height with his building as the property of another owner on the opposite side without any compensation at all. That was to say that a man who had built a tall building on one side had, so to speak, acquired for his upper windows rights over his neighbour opposite. But it was equitable that the owner of the low building should have the power to erect a building as high as the one opposite him. In other cases he thought a building owner should be allowed to go to a height not exceeding an angle of 45 deg. from the level of the public pavement opposite his house. They constantly heard of miserable cases where blackmailing came in, and in which, he was sorry to say, evidence was given by people in the profession, or connected with the profession, which simply shocked any right-minded man. Now if something of the nature of his suggestions were enacted many difficulties of the kind would be got over. Then, again, if any building were raised to a greater height than formerly, without any compensation to the owner, on the opposite side of the street, that owner should be allowed to build to the same height. Personally speaking, he had had dozens of agreements of such a character, and he thought them eminently equitable in cases of the kind. If that was what right-minded owners would do for themselves, it ought to be a thing that the Legislature would sanction, as a means of ridding them of many of the difficulties which presently hampered them. They frequently came upon cases where a small coal-hole suddenly become worth 1,000*l*. in compensation. In such cases their architecture was ruined, and ill-feeling was created which ought never to have been permitted. He quite agreed with those who suggested that they should have something in the way of a court for the settlement of disputes as to ancient lights similar to party-wall tribunals as constituted under the London Building Act; and that that court should be the final court of appeal. With regard to cases where money compensation was rightly due, they would, he was sure, do perfect justice. They must always remember that they would never get the Legislature to pass an Act to rob a man of property. They should be practical, and not simply talk of what they would like, but of what they had some prospect of getting.

Mr. Thomas Blashill said there was one point in Mr. Fletcher Moulton's paper which caused him to cast his memory back upon one or two cases he had had. Mr. Moulton, if he recollected aright, said that a man had a right under the present law to the use of the light which he had before, whether he required that light or not. In this connexion he was reminded of an interesting case he had in the City. He was rebuilding an important building which had had the ordinary windows in front of it. The new building, being intended for a public purpose, had a very different kind of lighting, both as regards height and window space, from the original building. Some three or four years after the building was completed, the owner of the property on the opposite side began to raise a new building. A dispute arose, and they went with it before the Master of the Rolls, Sir George Jessel, who had a great reputation of bringing a highly original mind to bear on every subject that came before him. He said that in this case they had preserved in the building, as larger and differently spaced windows, certain portions of the windows of the original building, and for those portions only were they entitled to the rights of ancient lights. They must not be allowed, he said, from the fact that they had preserved certain portions of the original buildings, to acquire the rights for the whole of their new buildings. The first thing they would have to ask themselves was whether they had preserved enough of their old lights for the new building. His lordship added that if they had not, the person on the opposite side had done them no harm. They were told that they must put a screen in front of their building which would reproduce the windows that existed in the old building, and then they would see whether through them they would get enough light for their purpose. It happened that the people on the opposite side of the way were not very sure of their case, and the chairmen of the companies concerned, after talking the matter over, decided to withdraw the whole case, each party paying their own expenses. This decision was come to behind the backs of the experts and of the lawyers, and he was very sorry for it, for he should have liked to have known whether Sir George Jessel was right, for the dictum he laid down seemed to modify what Mr. Moulton had said.

Mr. Delissa Joseph said he had very carefully perused the various papers that were read as well as the report of the discussion, and had found them full of interest. It seemed to him that they must start by accepting as inevitable the fact that the law had given certain rights to the owners of ancient lights, and that to take these away would be little short of confiscation. It was clearly within the right of the owner of a window to claim the light he obtained through that window, and to insist upon its retention. They, therefore, dare not ask the Legislature to interfere with existing rights, although they might ask it to simplify the law and the procedure in dealing with such a subject. They might ask Parliament to make the acquisition of new lights more difficult by one of the methods suggested by the various writers and speakers. They might, for example, adopt the Swedish system, which was simplicity itself, and might be adopted in this country with considerable advantage. They might also ask Parliament to make an appeal to law the last resource, and only after reference to an umpire or technical tribunal. It did not appear to him to be a greater hardship to have disputes such as those they had been discussing referred to an umpire or a technical tribunal than was at present the case with regard to party-walls. Here they had a question as complex, as varied, and as difficult as that of ancient lights, and a system by which experts were appointed to deal with it before the parties to it went to litigation. The result was that only in extremely rare cases was an appeal ever made to the law courts at all. It was possible that if the Legislature provided for compulsory reference of ancient light cases to an umpire or to such a tribunal, litigation regarding them would be prevented. One of the speakers had said something about a natural hesitancy to refer questions of this kind to arbitration, because a question of ownership might be involved; but he might say that where no legal question of an abstruse character arose as to the existence or non-existence of ancient lights, arbitration by an architect might be safely adopted, as most careful men kept some record by them of the building they owned, so that the legal questions would have consideration. He thought any one in building ought to study very closely the rights of surrounding properties. Where reasonable regard was paid to these, mutilation of a building would very rarely occur. He might say that his own experience showed him that in nine cases out of ten negotiations between parties resulted in an adjustment of the difficulties. If they failed they could fall back upon arbitration, and it was only where this failed that they had recourse to the law courts principally through the obstinacy of clients. With regard to compensation, he considered that where a man was deprived of his light he should receive the market value of it. But how was that to be arrived at? It seemed a simple method. They had only to approximately estimate the rental value of the floor space they would gain by the increased height which they obtained from their neighbour, and capitalising that, they would find the increased value put upon their property through the concession of certain rights by their neighbour. By these means they would be able to fix the amount of compensation payable, and they would be recouped for this in the first one or two years from the increased rental. With regard to the use of models in cases of dispute, he thought these brought to the minds of laymen a conception of the whole circumstances which could not possibly be done by diagrams. He was concerned within the last few months in a case in which he made successful use of a model. On his advice his client put the case before Mr. Fletcher Moulton. He took the model to the House of Commons, and in the course of half an hour Mr. Moulton came to the conclusion that his client had no case to take into court. His client was thereby saved the anxiety and expense of a prolonged litigation. The use of models, he contended, had the effect of saving their clients from unnecessary litigation, and sometimes of showing them the unreasonableness of their claim. Curiously he had not heard any one referring to the method of dealing with questions of the kind in Scotland. In Edinburgh and in other towns throughout Scotland there were Dean of Guild Courts. These were very ancient institutions, and had complete control of all building questions. Before the erection of any building was commenced plans, &c., were laid before the Dean of Guild Court, the members of which decided upon the questions of foundation, proper ventilation, proper drainage, the height, the paints which had to be observed in order to conform with local by-laws, and also what was known as the neighbourhood of buildings. All questions having a bearing on the relation of one building with another were considered by the Dean of Guild Court and adjusted on equitable terms. Passing on, Mr. Joseph said one might ask oneself, what was the real solution of the question they were discussing. They must at the outset take as granted that vested interests must not be interfered with. They could only, he was afraid, ask the Legislature to make it easier for them to adjust matters equitably and fairly without having resort to the law. He suggested arbitration as one remedy for the existing grievances. Of course it was possible the Legislature would not give them those simple methods of trying to dispense with lawyers. So long as the law was made by lawyers, as it had been for centuries, it was not very likely that they would have such legislation as would result in the reduction of the number of appeals to the courts. Supposing, therefore, that Parliament would not give them facilities for compulsory arbitration in these matters, then they must fall back upon the suggestions made by Mr. Fletcher Moulton. He said, let us apply to the question of the ownership of light the same principle which the Legislature has laid down with regard to the ownership of land. Where the owners of land were at one time found to be troublesome when railways were laid down, and refused to sell their land, the Legislature stepped in and told them that they must not stand in the way of works of public utility, that they must sell their land at a reasonable price, with something added as compensation for the pressure that had been brought to bear upon them. If such a principle were applied in the case of ancient lights it would be extremely valuable. The other suggestion made by Mr. Moulton was that the judges in deciding a case should have an architect assessor attached to the court in the same way as the Trinity Masters assisted the Admiralty Court. In concluding, Mr. Joseph deprecated the idea of the Institute going to the Surveyors' Institution for suggestion as to the framing of a Bill dealing with the subject. It was a matter in which he considered essential that the Architects' Institute should act by itself. Let the Council consider carefully the suggestion made by Mr. Brodie and bring a report on the subject before the Institute for consideration and adoption. Then he should like to see the Council itself promote a Bill to achieve the objects which they sought.

Mr. E. W. Hudson said he must take objection to the too frequent use of the word blackmailing in discussing this question. When the rights of ancient lights were admitted and allowed by the Legislature, they must not allow such a term to those who tried to protect those rights. They could go too far in talking of blackmailing without strengthening their case in any way. Of course, circumstances altered cases, and instances might occur where blackmailing did happen. He could give instances which he had met with in his own experience where it had been necessary to buy a house when a question of ancient lights arose, for the simple reason that it would not have been worth while to go to law as to the amount of compensation that should be paid. He did not agree with the speaker who deprecated that Institute joining with the Surveyors' Institution in a matter of such great importance to both. He had pleasure in supporting the proposition of Mr. Brodie.

Mr. W. M. Fawcett thought if in an Act they had a clause laying down that in future windows should have no ancient light rights, and setting out a procedure for dealing with those already existing, that that would be all that was sufficient. It would be hopeless to lay down any law or rules, because no broad principles could be agreed upon.

Professor Kerr said that in the very great details into which they had gone it had been shown how extremely difficult the question was. The principle which had always seemed to him to lie at the root of their troubles was, that as light was so extremely essential, especially in crowded neighbourhoods, no person

should interfere with it. It was an abstract principle which was not defined under the Prescription Act. It went no further than he had indicated, but it might be interpreted in many ways. He instanced the dictum of two judges to show that the judicial mind was at different periods as the poles asunder. They must remember this—apart from the fact that they, as architects, had the greatest possible objection to lawyers—that the latter were continually shifting their ground; the circumstances of the public were changing as were the times, but whether they could be satisfied with the developments and change of the law was another matter. As for going to the Legislature to legislate specially upon ancient lights, his opinion was that it was absurd. If they exerted themselves to the utmost in order to get Parliament to pass a new law with regard to ancient lights—well, he ventured to say they would never get Parliament to do it. That was why Mr. Roger Smith's Committee never did any good, though there was never a man more qualified than he to arrive at a thorough and practical conclusion. But how would they deal with the difficulty? Suppose the Institute were to take upon itself in a business-like way the work of adjudication, so far as possible. Suppose they authorised their Council to become a council of conciliation in such cases, and suppose by one way or another a question of ancient lights got there and they gave their decision—which would be a practical decision and not a lawyer's decision—he would be a bold man who would take the decision before the courts. He did not say how it could be done, but it was a suggestion that had not been heard before. There was another plan. They might get the London County Council to make by-laws about ancient lights, and they might rely upon it that that body would do it with a singleness of mind, and with the desire to serve the public at large; but whether they would consent to do anything was another thing. One thing they could rely upon was that in the case of ancient lights the architectural profession was sufficiently scientific to consider what had been the amount of light that had been obstructed. Although he supported what Mr. Brodie had brought forward, it was quite another matter whether it could be carried out in detail. He conceded, after his experience for many years as a district surveyor, that there was nothing more detestable in the whole practice of an architect than the way in which blackmail was levied in crowded districts. It was blackmail and nothing else. He thought they had the courts of law with them more than they thought as regards the establishment of a general principle, but to go to Parliament was not the thing he would recommend. If Mr. Blashill would tell them what the gentleman said who piloted the Building Act through the House of Commons, they would say nothing more about legislation. His advice, therefore, was to let the Institute do something; but whatever they chose to do, let it be in the interests of good feeling and propriety. The principle was such that he did not think they could change the law. The only thing was to administer it in such a way as to be inoffensive but practical.

Mr. E. Greenop said if there was a threatened injury the present law provided a remedy by injunction; therefore, there was no reason whatever for a change in the law to enable a judge to deal with the question of damages. The whole point seemed to be that the law existed, but it could not be exercised in consequence of timidity. The whole question seemed, therefore, to be one of putting backbone into the judges. Would it be possible to approach her Majesty's judges and represent the great evils the community was now suffering from? If, moreover, they were going to the Surveyors' Institution to suggest an amendment of the law, they should make it clear that they were only referring to the Prescriptive Act.

Mr. Douglass Mathews, replying to the discussion, remarked that they seemed unanimous in a desire to have some alteration, but he would remind the previous speaker that they could not alter the law on the matter of ancient lights without altering the Prescriptive Act. Mr. Hall had made a suggestion with regard to some principles to be laid down, but he ventured to say that general principles were absolutely impossible, because every case had its own circumstances which were to be seen to be appreciated. Therefore, there was this strong point, that, whether adjudication was undertaken by a third surveyor, an umpire, or a Court of Appeal, the adjudicators should have the opportunity of seeing all the circumstances and not be content with inspecting drawings or even models. Without seeing into circumstances themselves they would get absolutely false ideas. Mr. Hudson objected to the word blackmail, and he was right in his objection when a man in a bonâ fide manner defended his rights. But what could be said of the act of insisting upon 500*l.* for what was not worth 5*cl.*? Was not that blackmail? As to the Surveyors' Institution being invited to assist in dealing with the matter, he desired to point out how practical that course would be. The Surveyors' Institution was a large body, and representative of the profession in every shape and form. In addition, there were a great number of barristers and eminent lawyers in that body, and they might be a great advantage and assistance in the legal aspect of the question. With reference to Professor Kerr's suggestion that the London County Council should have the power to make by-laws, he was personally of opinion that that body was too fond of making by-laws, and that, moreover, this matter was too important to be dealt with in that way. In conclusion, he expressed the opinion that if the matter were brought forward boldly something would soon be effected in the way of an alteration of the law. At any rate, the result of the discussion would be that the ins and outs of the question would be more known, and they would be in a position to settle many cases outside that were now settled inside the courts.

The Chairman remarked that, with reference to seeking the co-operation of the Surveyors' Institution, he thought that body could help very considerably in settling the question, because its members were men of great experience. Its present President was on the Council of the Royal Institute of British Architects for many years.

The resolution was then put and carried unanimously.

The Chairman said the subject was narrowed down to one or two points—that they could not interfere with the present ancient lights; that they wanted a better procedure for deciding some questions in the law; and that they wanted to prevent the acquisition of future rights of light as far as possible. These were matters which could only be dealt with by experts, and it seemed to him that the best plan would be for the Council to select a committee. He promised them that the matter should be brought before the Council at an early date, when he hoped they would have something practical to lay before the general body of the Institute.

The Chairman announced that the next meeting of the Institute would be held on April 23, when a paper will be read by Mr. Killingworth Hedges on "Protection of Public Buildings against Lightning."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION.

The usual fortnightly meeting of this Association was held on Friday evening last week in the Meeting Room of the Royal Institute of British Architects, No. 9, Conduit-street, Mr. G. H. Fellowes Prynne, President, in the chair.

The minutes having been read and confirmed, Mr. J. A. Bonds was elected a member and Messrs. A. Atkinson and J. P. Clark were reinstated as members.

On the motion of Mr. R. S. Balfour, hon. secretary, a vote of thanks was accorded to Messrs. A. Waterhouse & Son for permitting a visit on the 24th ult. to the Prudential Assurance Company's buildings, Holborn.

A vote of thanks was also, on the motion of Mr. J. B. Carvill, hon. secretary, passed to Mr. B. T. Batsford for presenting to the library a copy of "The Art and Craft of Garden-making," by Mr. T. H. Mawson.

House List for next Session.

The Chairman then read the following nominations of the Committee for the House List for next Session:—

President:—*W. H. Seth-Smith.

Vice-Presidents:—*W. A. Pite, R. Elsey Smith.

Committee (ten to be elected):—L. Ambler, *A. Bolton, *W. A. Forsyth, *M. Garbutt, *H. T. Hare, *A. H. Hart, A. W. Hennings, *F. G. F. Hooper, W. B. Hopkins, G. A. Lansdown, *P. J. Marvin, H. P. G. Maule, A. B. Mitchell, *G. H. Fellowes Prynne, W. H. Raffles, E. A. Rickards, *H. A. Satchell, *E. Howley Sim, A. B. Thomas, and R. H. Weymouth.

Hon. Treasurer:—*Hampden W. Pratt.

Hon Librarian:—Arthur S. Flower.

Hon Secretaries:—*G. B. Carvill, *R. S. Balfour.

Other Officers:—Hon. Solicitor, W. H. Jamieson; Hon. Assistant Librarians, A. A. Carder, F. J. Osborne Smith; Hon Auditors, W. E. Davis, E. Greenop; Secretary and Registrar, D. G. Driver.

The Chairman said that any member may nominate additional names at the next meeting in accordance with the by-laws.

Mr. Basil Champneys then read the following paper, entitled

Hints on the Study and Planning of Collegiate Buildings.

"In dealing with the subject of collegiate architecture, I do not propose to discuss at any considerable length its archæological aspect, but rather to dwell on the practical questions which are likely to present themselves to those who have to deal with collegiate buildings of the present day. It is, however, desirable to say so much with regard to the past as may serve to make clear the ideal which the builders of old set before them, and to show what changes of custom have served to modify the original standards and to present the problems of the present day under somewhat different conditions from those of an earlier age.

Every one knows that at the time when the college buildings at the old universities were erected the students entered on their university career at a much earlier age than is customary at present. Also that the standard of expense was generally very much lower than it is in our own day. The same tendency which has influenced so many of our great public schools is apparent in the development of Oxford and Cambridge.

Starting as institutions for the education of all classes, and especially for the lower middle class, they have in a considerable degree become annexed by the more wealthy; and a public school or university education is now considered to be the privilege of the more wealthy, whereas formerly they were designed for the training of all who had sufficient ambition or enterprise, and offered every facility to those who were prepared to face poverty and hardship in the pursuit of mental training.

Another tendency which is apparent in the evolution of university buildings, but altogether dissociated from the conditions above mentioned, is that of centralisation. In mediæval times large and important colleges were the exception, and small halls, intended for the housing of a few students each, were the rule. Some of the largest foundations both at Oxford and Cambridge have been formed by the absorption of a number of these smaller abodes, which usually have disappeared in the process. One Oxford College, Worcester, is, generally speaking, a conglomerate of these smaller establishments, as its present conformation clearly shows.

While the change in the age of the students revolutionised the arrangement of rooms, the increased size and scope of the colleges afforded occasion for larger and more comprehensive schemes of planning, and made effective grouping of the buildings possible.

With regard to the former of these changes, the mediæval arrangement was as follows. A set of college rooms consisted of one fair-sized room, with two or more rooms, usually two, opening from it. The larger room was used as a dormitory, in which a few students and a Master of Arts slept, the master being placed there to keep order, while the smaller rooms were used as studies in the daytime. So long as the students were mere boys, this arrangement was reasonable—not dissimilar to that at some of our public schools, where a "prefect," or "monitor," keeps order in a dormitory of younger boys. As the age of students increased, and as the class from which the students were drawn was simultaneously raised, this arrangement naturally gave way to the more modern one. The large room became the living or "keeping" room for a single student,

* Members of the present Committee

* Members of the present Committee.

and one of the smaller rooms or studies was the bedroom, another being used as a "scout's hole"—as at Oxford—"gyp-room"—as at Cambridge—a sort of pantry, larder, and coal-cellar in one. In many colleges the division of the rooms remains in its original state, the only change made being their re-assignment according to the new method. In other cases some structural modifications have been made; and, as it very frequently happened that only the outer walls and the cross-walls which carried chimney-stacks were of masonry, the rest of the structure being mere partitions, such adaptations were easily made without any radical change.

The great increase in the size of colleges opened the way to the development of collegiate planning on an extensive scale, and suggested the type which nearly all existing colleges to some extent illustrate—the grouping of the buildings into one, two, or more quadrangles of rather low buildings. In the original colleges there are never more than two floors and an attic, from among which the special and more important features, the chapel, the hall, and the library rise into pre eminence.

The lodgings of the president, warden, principal, master, or whatever he happened to be called, was usually included in the general grouping, and are seldom distinctive features in the older college buildings. In the present day, the head of the college usually requires a more sumptuous abode, which must become an important item in contemporary college building, while the fact that many of the tutors and fellows are now married will also serve to complicate the future of collegiate grouping.

Besides the hall, chapel, and library, it was usual to mark the main entrance of the college, often, too, the side entrances, or entrances to a further quadrangle, by towers—a reminiscence, no doubt, of defensive architecture, in which all approaches had to be specially guarded.

For the students' rooms, the general arrangement is almost invariable. A staircase entered from the quadrangle led to rooms on either side; and, as there were three floors, opened out six sets. This arrangement is usually adhered to in contemporary schemes, as I think with good reason. The alternative plan adopted by Mr. Butterfield at Keble College is to make the main block of rooms sufficiently wide to accommodate two sets of rooms in depth, with a central corridor from which the rooms open. I do not think, however, that this arrangement is likely to find general favour. It is not favourable to effective grouping, as the blocks of rooms are apt to look bulky and clumsy; and as regards economy, I made on one occasion the most careful comparative estimate of the two methods, and found that the old gave an equal amount of accommodation at considerably less cost. In this case, *stare super antiquas vias* seems to be the best policy on practical no less than on æsthetic grounds.

In the few cases in which a departure from the ancient type has been attempted the result appears to me to be most unsatisfactory, and completely destructive of collegiate character. At Keble College the architect's intention evidently was to keep the ordinary buildings entirely subordinate to the chapel, and as the chapel is very unusually large and lofty, this idea is not altogether obscured; but it would have been far more completely and satisfactorily developed had the ordinary rooms been planned upon the old-established system. The result seems to be no less subversive of collegiate effect if the ordinary buildings are of four instead of three stories. The "new buildings" at New College, erected by Sir Gilbert Scott about 1876, seem to me to fail for this and for other reasons. At King's College, Cambridge, a new group of buildings has in recent years been built by Mr. Bodley. Here again a fourth story was insisted on by the college, and, needless to say, everything that was possible has been done to give them, in spite of this condition, a collegiate character. The fact that this endeavour, even in Mr. Bodley's hands, has not proved altogether successful, appears to me to be the best possible confirmation of my opinion that a fourth story is necessarily unsuitable to such architecture; while in this case the scheme, that of a three-sided quadrangle with the fourth side open to the river remains and may long remain incomplete in consequence of this unnecessary development of height. The whole scheme might have been completed for about the same cost as the present truncated instalment.

In both these instances the extra story had been, I believe, forced upon the architect, and the motive for this dictation was no doubt in a large measure a desire for economy. My conviction is that there is no economy secured by piling up buildings to an unusual height. I have tested the comparative cost of buildings of two, three, or more stories with the following result:—A building of two stories is definitely more costly for the same accommodation than one of three; but four or more stories are not more economical than three. Of course, where ground is limited in extent, or of very high value, a new factor is introduced; but in the case of college buildings this is rarely the case, and there is seldom any valid excuse for departing from the old type.

In fact, the old system of college planning, in my opinion, still holds its own, and needs but few modifications to bring it up to date. A few practical requirements consequent on the change of custom have to be met. For example, when a set of rooms was composed of a large dormitory and two smaller studies, it was rather advantageous than otherwise that the smaller rooms should be approached through the larger. This was conducive to quiet in the studies and caused no inconvenience. Now, it is essential that both bedroom and cupboard, or "scout's hole" or "gyp-room," should be independently accessible, though there is some advantage in having a door between the sitting-room and bedroom, as it allows the bedroom to some extent to benefit by the sitting-room fire. Again there is no need for the "scout's hole" or "gyp-room" to be as large as one of the old studies; it need be little more than a mere cupboard, and one of the most modern ideas is to provide for a group of rooms a kind of general "scout's hole," or pantry, with a sink and gas stove.

These are the principal points in which a modern set of rooms differs from the ancient type, which on the whole has vindicated its claim to be applied to modern schemes as the best and most economical arrangement.

Before passing to other phases of collegiate architecture, it may be worth while to consider what was the most highly developed idea of a mediæval college, and of this no better example could be selected than New College at Oxford, which in its ancient form showed a complete design carried out at one time. In order to realise Wykeham's idea it is necessary to remove in imagination certain later additions which have obstructed the original intention. The chief of these is the addition of a story to the main quadrangle. This raises the buildings almost to the same level as the gateway tower which originally surmounted them, and also decreases the predominance of the chapel. William of Wykeham was a great Churchman, and his intention was to make the chapel the great feature of his main quadrangle. Its great height and scale still preserve its relative importance, though its superiority to the residential portion of the quadrangle is greatly hampered by the added story. The dining-hall is built in continuation of the chapel, and originally the two were under a continuous roof. Sir G. Scott in his restoration raised the pitch of the chapel roof, divorcing it from the line of the original parapet, with which it now makes an exceedingly awkward angle. The floor of the dining-hall is raised several feet above the ground, while the chapel floor is on the ground level, so that the internal height of the hall, though lofty, is much less than that of the chapel. The approach to the hall is by a staircase opening from the main quadrangle under a tower rising considerably above the hall and chapel. In the tower are a series of chambers, the purpose of which is not very obvious, but which have the advantage of being in all respects as Wykeham left them.

Opposite the main entrance to the college was the library, the conformation of which can still be traced, though it too has been modified by the addition of a story and the modernisation of the windows. An archway passing beneath the library gives access to the garden quadrangle, which originally consisted of two short projections—one of which still retains its ancient timber roof, and was probably designed for its present purpose, that of a common-room for the Fellows.

To the west of the chapel, a position no doubt dictated by the conformation of the site, are the cloisters enclosing a garth, intended no doubt for a burial ground, and adjoining these at the north-east angle is the very simple but effective bell-tower, the great severity of which is probably due to its position as an outwork of the city wall.

The great predominance of the chapel over the adjoining buildings, and the presence of the cloister and the tower, are somewhat exceptional features in college architecture, and serve to emphasise the ecclesiastical intention of the founder. The same idea is manifest in a college of modern foundation, Keble, which, as a memorial to a well-known Churchman, was founded with a somewhat similar view. Other colleges which bear the impress of a specially ecclesiastical ideal are Christchurch and Magdalen at Oxford, and King's at Cambridge. In the more ordinary type of college, the chapel, hall, and, in many cases, the library are salient features in the grouping, but their relative importance varies very considerably.

So far I have spoken of the ordinary type of college buildings as developed in the Middle Ages and adhered to in the sixteenth and seventeenth centuries. Modern civilisation has, however, given birth to new phases of collegiate life which involve certain modifications of the original character of the building, though the collegiate standard must still retain much of its influence.

The first and most important of these is the establishment of colleges for women both at Oxford and Cambridge. It is clear that the life in these must necessarily be of a more domestic character than in colleges for men; and, if the style of architecture follows the requirement, the result will be something which may be called "domestic collegiate." Access to the several students' rooms can no longer be from staircases entered direct from the open air; the approaches must be properly enclosed and the passages warmed. In the instance I propose to describe, that of Newnham College, the deviation from the original type is greater, because the system of the college is that of subdivision into halls, each of which is, on the whole, complete in itself; the only features used equally by the entire college being the great hall and the library. Moreover, the scheme, as it now stands, has been developed piecemeal—has started from small beginnings and grown up step by step, each instalment of the group of buildings having been supposed, at the time of its erection, to be the last, until the pressure of applicants suggested a further extension. I can briefly indicate the stages by which this group of buildings has attained to its present scope.

Another building which also deviates from the original type on account of a change of purpose is Mansfield College, which contains all the features of a college without residence for students. Mansfield College is intended to be a centre of life for students of a particular religious denomination living in the colleges of the University, but assembling at Mansfield for services, lectures, and for social converse. The only residents are the principal and a few tutors. Mansfield College, therefore, consists of a chapel, a hall, a common-room, with the requisite offices, bursar's and tutors' rooms, a few bedrooms and several lecture-rooms, a large library, and a principal's residence. This scheme suggests a somewhat different system of grouping from that usual in colleges of the ordinary type, though at the same time it was for many reasons desirable that the group should as far as possible reflect the character of Oxford collegiate buildings. The drawings which I show will explain how I have endeavoured to meet this somewhat novel problem.

Having finished the reading of the paper, Mr. Champneys briefly described some drawings of Mansfield College, New College, and Newnham College in illustration of some points he had been alluding to.

The Chairman, in opening the discussion, said the paper which Mr. Champneys had read was an extremely valuable one, in that the subject was one about which not very much was generally known. There were only a few men in the profession who had a chance of thoroughly studying the subject, and yet there was no work in which the individuality of the architect could be made more manifest. In Keble College, whether they liked it or not, there was the individuality of the architect; in All Souls' College, while the building retained the collegiate feeling, Mr. Pearson had marked his own individuality in the work he had carried out; while in no work was individuality mo to be seen than in Mr. Champneys' collegia

buildings—at Newnham College, and elsewhere; individuality was also to be seen in Mr. Bodley's work at King's College, and in spite of the four stories, which had been referred to as a defect, Mr. Bodley had left his individuality on that work. He (the Chairman) agreed very thoroughly with Mr. Champneys' remarks as to carrying on the feeling of our collegiate buildings and not breaking away from the traditions, as it were, of those buildings; at the same time, as Mr. Champneys had said, architects had quite a different set of conditions to deal with in modern college buildings; they might call their work Domestic Collegiate, whereas, in mediæval times, it might have been called Monastic Collegiate. But still, the planning of old colleges had answered very well, and architects could not do very much better in the present day. Although, for various reasons, Keble College had not been the success one had hoped, yet there was in the design great originality and evidence of a master mind.

Mr. E. W. Mountford, in proposing a vote of thanks to Mr. Champneys, said that both at Oxford and Cambridge one could see the very beautiful collegiate work which Mr. Champneys had carried out. He (the speaker) had spent much time in studying the University buildings there and, not being much of an antiquarian, he was bound to say that the new work was much more interesting to him than the old, and amongst the new work that carried out by Mr. Champneys was of the best. What one felt in looking at such modern work was that modern architects could have done even better than the old architects had they had as good chances and opportunities. Modern architects were, generally speaking, hampered by the limitation of cost imposed by the client, and that was not so to the same extent with the original architects of those collegiate buildings. He could not imagine a more charming elevation than Mr. Champneys' Mansfield College; but when inside the building, one felt disappointed that the walls were only 18 in. thick instead of 3 ft., though that, of course, was not the architect's fault. As the Chairman had said, Mr. Butterfield's Keble College had not been such a successful work as some other modern University buildings. One could not speak about college buildings without referring to Gilbert Scott's work at Pembroke, which seemed to be absolutely perfect. But a great deal of very good modern work had been done at both Oxford and Cambridge, and in his opinion that work was equal to any collegiate work done in the fourteenth and fifteenth centuries.

Mr. W. H. Seth-Smith, in seconding the vote of thanks, said that in the paper was condensed a great deal of information on the subject and the historical information was also of considerable value, especially to those who visited the Universities, and who would care to trace, by means of the information contained in the paper, the development of the colleges. One felt that Mr. Champneys had had an opportunity in his college work of developing the tendencies of the age, working away from the usual traditions of college planning and giving expression to the new and ordinary requirements of college life; and that in itself was of considerable interest. There were one or two points on which, perhaps, Mr. Champneys might be able to give them a little more information. One was as to aspect—the aspect of the principal college buildings. In planning a college, what would be the ideal aspect of the class-rooms? It was very interesting to hear Mr. Champneys' remarks about quadrangles, and nothing could be more forcible than his reasons for not going up four stories, or even three if it could be avoided. The most forcible reason of all was that in college buildings of more than three or four stories one could not emphasise the principal buildings, the library and hall or the chapel. Mr. Champneys' remarks, too, as to the relative expense of tall and low buildings were valuable. Clients had an inveterate idea that the same roof did for any number of stories, and, therefore, the higher the building was carried the cheaper it would be. That certainly was a mistake, for one thing, the higher the building went the more considerable was the difference in the cost of cartage and carriage of materials; while, in the case of a quadrangle, the higher the buildings the less light and air—a matter of great importance to a college. He would be glad to have Mr. Champneys' views as to the influence of high buildings upon health. He (the speaker) was much interested in the question of the central corridor system. It was very difficult to arrange a central corridor in colleges without darkening it very much, especially on the lower floors, where the men's names on the doors could often not be read; while the ventilation was frequently unsatisfactory. He believed that at Selwyn College the instructions to the architect were that he was to plan the cheapest possible building, and the result was that in every case—in all the blocks as far as he could remember—the rooms were arranged on either side of the corridors, which were terribly dark and a complete failure. There was a rather important point in regard to the quadrangle, viz., that when buildings were erected in that form they could not be extended if desired; if one side were left, a chance was afforded for extension. It was to be observed that in all the older colleges the blocks of students' rooms were approached from the open air, through the quads; and it was only in the new Presbyterian College at Cambridge that that traditional arrangement had been departed from; there the students' rooms were entered under the main college roof. It was interesting that developments in college planning should have taken place in women's colleges, and it was evident, in view of the popularity of the women's movement at Cambridge, that had the Architectural Association admitted women as members, their premises would have become inadequate to their requirements! He would like to hear about the ventilation of these buildings, especially the ventilation of the class-rooms; and as to the ideal method of treating the walls of colleges. Some time ago he read a schoolmaster's remark that his ideal class-room would be one with an asphalt floor and glazed-tiled walls, so that every evening water could be turned on to them, and the walls and floors in that way thoroughly cleansed. That, he was afraid, would be rather a cold treatment. He would like to know what kind of stone Mr. Champneys had found most durable for college buildings, especially in Oxford, the climate of which had such a destructive effect on stone.

Mr. G. B. Carvill said he should like to add his testimony as to four-story buildings. Two classes of buildings had been referred to that evening—the mediæval college and quite the modern building; but there was another class, viz., that put up early in the present century, and which were generally failures because they were carried up too high. Whewells Court at Trinity was carried up to four and almost five stories, and the result was that the rooms were so dismal that students could not be got to stay in them and the rooms would not let. Two stories were taken away from the sunny side and the sun was let into the quad, with a satisfactory result, and the rooms then let.

Mr. H. P. G. Maule asked what arrangements were made as to baths in the colleges.

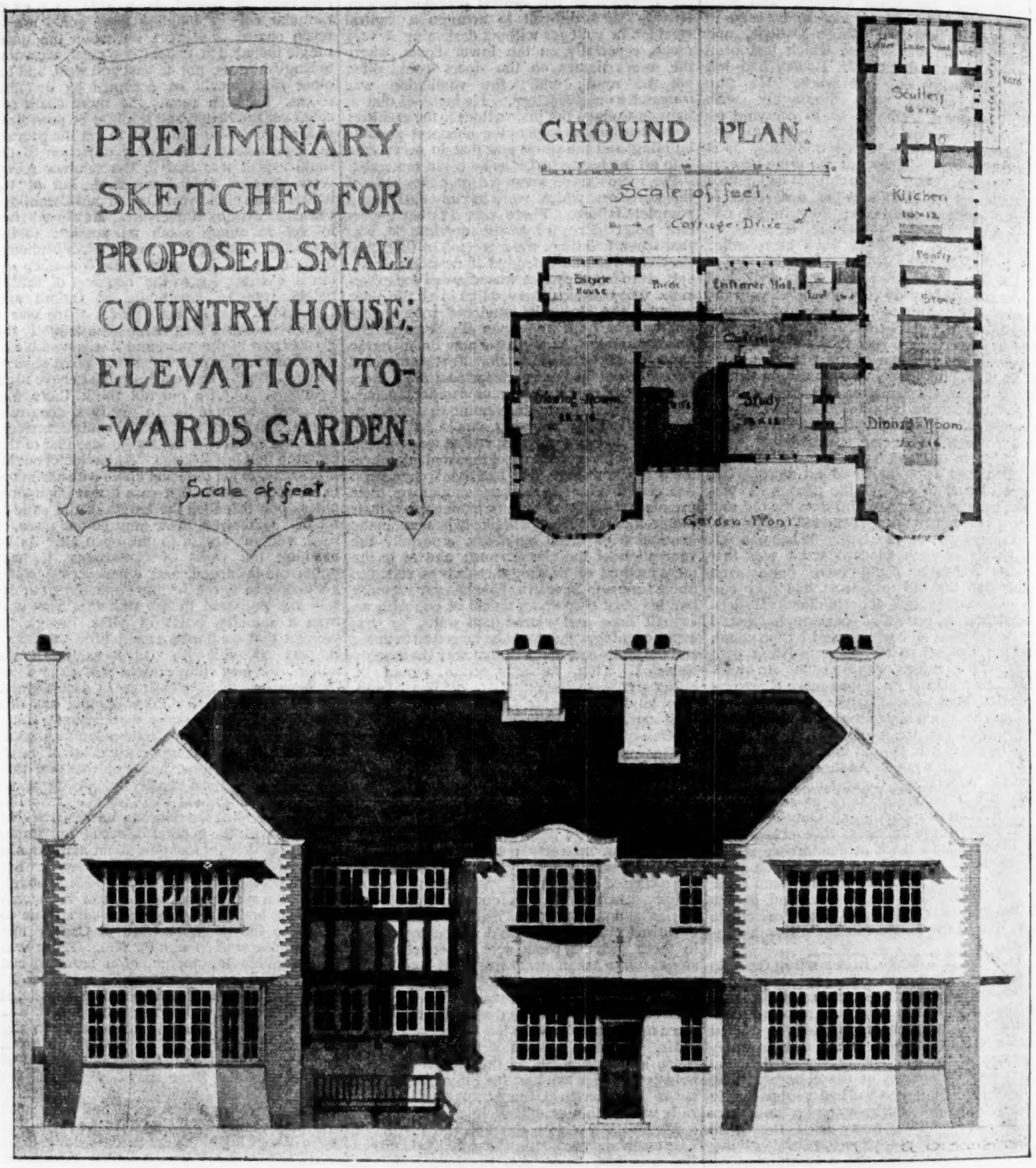
Mr. Weymouth asked Mr. Champneys for more information as to the actual working between the kitchen and the dining halls. As far as he understood, the arrangements generally were rather primitive.

Mr. Forsyth said he did not agree with the Chairman's remarks about the individuality of the architect being left in these buildings. That was a rather dangerous matter. It had ruined Cambridge in some parts.

The Chairman said that in the plans they had seen that evening Mr. Champneys had departed from the traditional fifteenth-century college building, and in a sense had excelled the mediæval architects, though he (the speaker) could not at all agree with Mr. Mountford's remarks. As to individuality, he did not mean that architects should destroy the best work of the past in order to express that individuality (and, of course, there were some cases of that), but that in making additions to an existing fifteenth-century building, say, it should be the endeavour of the architect not to make a mere copy of the existing work, but to show his own mind in the new work. It gave much additional interest in a work to see individuality marked in the design.

The vote of thanks was then put and carried very heartily.

Mr. Champneys, in reply, said he was glad Mr. Mountford had called attention to Gilbert Scott's work at Pembroke, for that work had always excited his (the speaker's) admiration. They were buildings of remarkable excellence, and it was to be regretted that the architect had not had more scope; Scott came in rather late in the day, and if he had had more to do with Pembroke College it would have been better for the architecture of that building. In reference to aspect, as a rule in a quadrangular college building there could not be much choice of aspect, for when the quadrangle included a chapel one must, according to English ideas, put it east and west, and the other sides would be occupied by dwelling rooms. In such rooms the more south one could get the better, and it might be possible to so arrange the buildings as to get the prevailing aspect south. The only objection to the south aspect was that in the summer rooms were exposed to a fierce heat, but at the hottest times of the year Oxford and Cambridge ceased to exist as Universities. He always tried to get as much south as possible in the domestic buildings of such establishments, though, as he had said, there was often not much choice. As to the question of health, height was an advantage at Oxford and Cambridge, for in both places there was a certain amount of mist rising almost nightly the greater part of the year, and it was possible to get above that, and so far as that point of view was important it seemed desirable to have high buildings. But he did not think there was sufficient reason in that to justify a departure from the old tradition. As to a central corridor, there were other difficulties besides that of the building bulking so large. An architect ought, if possible, to get the scout's hole with a window to the open, and in that case it was impossible unless one extended the length of the suite of rooms. Otherwise, there must be one room, at least, without access to the open air. As to finishing the walls of class-rooms, he was rather old-fashioned, and whenever he could get people to agree he used panelling, but he was not prepared to say that that was best from a sanitary point of view, though he thought that sanitation was a little overdone. It was possible to carry sanitary fads rather too far; they might be carried so far as to be quite destructive to architecture. He did not think, for instance, that any one could desire class-rooms with asphalt floors and glazed walls except from a sanitary point of view. It was an important point of view, but not the only one, and not the one that architects took most readily to. As to stone, one had to be guided to some extent by the colour. He liked the floors to be generally in harmony with the general colour of the stonework. He thought he knew about half a dozen stones which could be trusted to wear, but none of his buildings had been up long enough to test the weathering qualities of the stone. Yorkshire and Lancashire stones and those to be got in the neighbourhood of Carlisle had always done well enough for him. There was a stone called Remington, of a beautiful red colour, which he used, and which seemed to be lasting well. As to the external use of stone, at Oxford stone had a bad name, though it was not altogether the fault of the stone. In the old buildings a great deal of stone from the Headington quarries was used, and the masons in those days were in the habit of face-bedding it. In nearly all the old colleges that stone had been used and used face-bedded, and that was why the stone of so many buildings at Oxford was to be seen peeling off in the most disastrous manner. Pieces came off in layers, though that gave the buildings a look of antiquity. As to the Master's Court at Trinity, he could speak with some feeling, because he was there himself—one of the first occupants. The buildings were then called the Master's Hostel, and were far higher than they ought to be, though that was not the whole of the evil. The quadrangles were very much smaller than they ought to be—not much larger than wells—and it was impossible for much sun or light to get into them. Many of the rooms were very gloomy and dismal, and the whole thing was a big mistake, arising out of a desire to crowd a great amount of accommodation on an altogether inadequate site. As to baths, undergradutes had not attained to bath-rooms yet. He had tried not to ignore the point of keeping the dwelling rooms down in order to emphasise the chapel and the hall. At Keble College the chapel was less pre-eminent by the fact that the domestic part of the group bulked so large; but the plan of making the chapel and, perhaps, the library, predominate, was not universal. In some colleges they were designed to give a pleasing relief to the architecture, but did not predominate; it was in buildings of a more ecclesiastical character that they were intended to do that. In Mr. Butterfield there had, he felt, passed away one of the greatest architectural influ-



ences and powers of the century. Although there were points in his work against which he (the speaker) constantly rebelled, he had always had the strongest possible feeling in looking at Mr. Butterfield's work that there was somebody there, and somebody distinctly great. One part of Keble College was extremely fine, *i.e.*, the view of the chapel from the interior of the quadrangle; but generally, as to the architect's work, he felt more admiration than sympathy for it.

The Chairman announced that the next meeting will be held on the 27th inst., when papers on "Colour Decoration" will be read by Messrs. J. D. Crace and Gerald Moira.

The meeting then terminated.

METHODIST FREE CHURCH, KINGSWOOD, BRISTOL.—The foundation stone of the United Methodist Free Church, at Mount Pleasant, Kingswood, was laid on the 2nd inst. The building will be of red Pennant stone, with Monk's Park freestone dressings, and the roof of pitch pine will be slated. The internal joinery and the seating will be of pitch pine, and the floor will be of Messrs. Geary & Walker's pitch pine blocks. The accommodation will be for about 450 persons. Mr. W. Paul, of Bristol, is the architect.

PROPOSED SMALL COUNTRY HOUSE.

THIS is a design by Mr. G. O. Scorer which was exhibited at the Arts and Crafts Exhibition.

The walls were to be of rubble covered with rough-cast and coloured white, and with moulded stone copings; the angle quoins and the facing of the lower part of the walls of red brick. The dining-room to have a wainscot dado and the drawing-room a deal dado 5 ft. high, in square panels, painted white. The staircase to be of oak.

The first floor plan includes three bedrooms and two servants' bedrooms and two bathrooms.

The long side of the drawing-room faces south and the garden front east.

BAPTIST SCHOOLS, OLD BASFORD, NOTTINGHAM.—New schools in connexion with the Baptist Church, in High Street, Old Basford, were opened on the 29th ult. There is a central hall, 63 ft. 6 in. by 47 ft., with a gallery on two sides and one end, the hall being surrounded by seventeen class-rooms, accommodating 500 scholars. The architect was Mr. W. V. Betts, of Old Basford, and Mr. W. J. Hutchinson was the contractor.

THE BUILDING TRADES' GIFT TO THE NATION:

PERMANENT HOMES FOR DISCHARGED SOLDIERS.

THE Executive of the Building Trades' Gift announce that their offices will be closed until Wednesday inclusive over the Easter holidays, and that the next list of gifts will not be presented until the week following Easter week.

During the first two days of the current week the following subscriptions and contributions have come to hand:—

Additional Subscriptions.

	£	s.	d.
Messrs. Malcolm, Macleod, & Co.	11	0	0
Mr. W. H. Pearce	10	8	7
Workmen of Messrs W. H. Pearce	10	8	7
Workmen of Messrs. George Jackson & Sons	8	3	3
Workmen of Messrs. Hall, Bedelall, & Co.	5	14	3
Messrs. James Blyth & Co.	5	8	0
The Builders' Materials Supply Stores	5	5	0
Workmen of Mr. George Green (Aylesbury, Bucks)	3	6	6
Mr. George Green (Aylesbury, Bucks)	3	3	0
Messrs. William Titmas & Sons	3	3	0
Workmen of Messrs. James Blyth & Co.	3	0	0
Workmen of Mr. Ernest Ireland (Morecambe)	3	13	9

Workmen of Messrs. William Titmas & Sons	£2	11	9
Workmen of Messrs. G. Aston & Sons	2	9	6
Workmen of Messrs. Boshel Brothers (Brighton)	2	4	6
Workmen of Messrs. H. Dakin & Co. (Putney)	2	1	6
Workmen of Mr. William H. Forde (Birkenhead)	1	16	0
Workmen of Mr. Fred. Perren	1	15	0
Workmen of Mr. George Neal (Kilburn) (second donation)	1	14	3
Workmen of Messrs. R. B. Hilton & Sons (Deptford)	1	5	0
Workmen of Mr. T. F. Dobell (Stoke Newington)	1	2	0
Workmen of Mr. William Mousley (Bingley, Yorks)	1	1	6
Mr. William Mousley (Bingley, Yorks)	1	1	0
Workmen of Mr. R. Ridley	1	1	0
Messrs. H. F. Green & Co.	1	1	0
Mr. Ernest Ireland (Morecambe)	1	1	0
Mr. J. C. Base (Stratford)	1	1	0
Workmen of Messrs. H. F. Green & Co.	0	17	0
Workmen of Messrs. W. Reddish & Son	0	12	0
Workmen of Mr. F. Athey (S. Norwood)	0	10	6
Workmen of Mr. James Hill (Barnes)	0	8	0

Additional Contributions for Individual Sections.

The Patent Tile Works (Bridgwater).—1,000 red double Roman roofing tiles with the necessary ridge tiles.

The Mosaic Manufacturing Company.—80 yards wood block flooring.

The Limmer Asphalt Paving Company.—200 yards super asphalt for footways.

Mr. Charles W. Matthews.—The whole of the stone-work for one home.

Messrs. Wiggins & Co.—Ridge tiles and finials for four homes.

Mr. James Cann.—One ton of whiting.

Mr. Thomas Crompton (Ashton, near Wigan).—Ironmongery to the value of 10*l*.

Messrs. Minton & Co. (Stoke-on-Trent).—100 yards fancy tesselated tiles.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A meeting of this Association was held on the 4th inst. in the Royal Institution, Mr. James Bruce, W.S., presiding. Letters were read from Sir John Stirling Maxwell, M.P., and Sir Lewis M'Iver, M.P., with reference to the preservation of ancient historical buildings in Scotland, alluded to in the address of the President at the beginning of the session. The former said it was difficult to urge any action in such a matter on the Government, except in particular instances or with a definite plan, and they must look to associations such as theirs to guide them. Four sessions in the House of Commons had convinced him that general discussions were quite fruitless, and so were all attempts to urge a change of general policy on the public offices. There must be cases in which buildings in the occupation of the Crown or the Government could by the removal of partitions, additions, and the like, be restored to their original state and relieved of the uses to which they are now put. Such cases could be urged on the Government with hope of success, and it would be very useful if their Association could prepare a note of them. Sir Lewis M'Iver suggested that if the Association could bring all the Scottish members together without respect to party, Government could hardly disregard their combined demand.—An address was afterwards given by Mr. W. H. Hole, R.S.A., on "The Relation of Mural Painting to Architecture." Mr. Hole pointed to the modern neglect of mural decoration, and insisted on the trinity of the arts—architecture, sculpture, and painting. He urged the importance of the service of colour to architecture, alluding to the examples of the past. They had to recognise the fact that art was not popular. They must ascertain the cause and find the remedy, and they had also to ensure the necessary training on the part of the artists themselves. No art could be popular, he maintained, which was not decorative, and if the fine arts were more decorative they would be more popular. The selfish isolation of the arts was at once the characteristic and the curse of modern British art life.—On the 7th inst. the members of this Association visited Balvaird Castle and Edenshead. Mr. Thomas Ross, in the course of a description of the Castle, said that the earliest mention he had seen of Balvaird, or Baleward as it was called, was in a "Gift by Henry of Freslay, lord of Fourgy, to the Abbot and Convent of Cambuskenneth, in return for the benefits and honours conferred by them on himself and his predecessors, and for the salvation of his soul, of the mill of Arringrosk," &c., dated July 27, 1295, in which he bound himself to compel his tenants to use the mill. The party then drove to Edenshead, where, after the old house and the site of the Roman camp had been described by Mr. James Bruce, the members were provided with refreshment by the President. Mr. Ross was then thanked for acting as leader, and the Rev. P. M. Herford proposed a vote of thanks to Mr. and Mrs. Bruce for their hospitality.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the ordinary fortnightly sessional meeting of this Association, held on the 4th inst., Mr. W. de Gray Birch, LL.D., F.S.A., in the chair, Dr. Winstone exhibited two copper medals dated respectively 1794 and 1795. These medals were issued to commemorate the trial and acquittal of the charge of high treason of Thomas Hardy and Isaac Eaton, and they afford interesting evidence of the great political struggle existing at the period between the landed proprietors and the trading classes. Descriptive of these medals, Dr. Winstone read a paper on the political history of Parliamentary reform. The Hon. Secretary announced that the annual meeting would be held on May 2 at 4.30 p.m. at 32, Sackville-street.

ROYAL ARCHÆOLOGICAL INSTITUTE.—A general meeting of this Institute was held on Wednesday, the 4th inst., Sir Henry H. Howorth, President, in the chair. Mr. Miller Christy exhibited and described a rubbing of an incised slab to Jehan de Trouville, date 1305, at Héricourt-en-Caux, Normandy; also rubbings of priests from the churches of Middleton and Bradwell, both dated 1349, and of foreign origin. In illustration of Mr. Christy's paper Mr. Mill Stephenson exhibited several other rubbings of incised slabs from various parts of England. The President read a paper on "The Cyclic Poems and the Homeric Question," a subject which does not come within our scope; and Dr. Wickham Legg read one on the gift of a Papal cap and sword to Henry VII. The paper contains a transcript of a cotton manuscript describing the arrival of the Pope's Cubicular (Bishop of Concordia) in England, and the ceremonious delivery of the cap and sword at St. Paul's in the late autumn of 1488. The speech made by the Cubicular on this occasion had been preserved by the Poet Laureate, and the divine service had been found transcribed into a pontifical in the University Library at Cambridge. During the ceremony a London fog had come on "so that no man of a great season could tell where the King was."

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—At a meeting held at the Westminster Palace Hotel on the 6th inst., the Chairman (Mr. Basil H. Joy, A.M.I.Mech.E.) presiding, a paper was read by Mr. Eustace W. Porter on "A Comparison of Railway Bridge Structures of Moderate Dimensions and of Methods of Determining their Working Loads." The author first dealt with considerations relating to the best type of bridge for particular cases, and enumerated several examples. The structures to which the comparisons referred were intended to carry a "light" railway of standard gauge, and the loads assumed, in addition to the weight of the structure itself, were 0·03 ton for the permanent way per foot run and a train of engines having an axle load of 8 tons, present Board of Trade rules being used. Diagrams were exhibited denoting the live loads, and types of the spans employed, with their weights up to 100-ft. span. Comparisons were next drawn between a masonry arched bridge and one having a steel superstructure, showing the economy, at the present price of steelwork, in employing the former, up to 40-ft. span, where conditions permitted the use of an arched span. In introducing the question of bridge piers, the points to be considered in designing structures for countries subject to earthquakes were alluded to, the author stating that the best course in such cases was to construct a steel trestle pier stable without any assistance from the foundations, since a mass of masonry would favour the transmission of momentum, being capable of receiving the full force of a shock due to an earthquake. Since earthquake shocks are not so severe below the surface of the ground it was advisable to arrange that such structures as bridge piers should rise, where possible, from a deep free foundation formed of steel work, in preference to masonry, thus allowing the whole structure to have the same natural period of vibration. A diagram was shown, giving the type and weight of steel piers, and cubic contents of masonry piers up to 100 ft. in height, admitting of a comparison of the cost of each, and the effect of wind pressure on such structures was then treated at some length. In comparing the various methods in vogue for determining the working loads on bridges, some of the errors occurring when stresses were calculated under the English Board of Trade rules were indicated. A digest followed of the rules most general in America, also those of the India Office for railways in India. The author concluded by suggesting the form that the (now very desirable) new British rules should take. Briefly expressed, it was as follows:—The total working load for any member of a bridge, to be taken as the maximum moving load, multiplied by co-efficient, and added to the dead load. The co-efficient to be 2 for all members except main girder flanges, for which 1·5 might be used. The total working stress on the minimum net area not to exceed 8 tons per square inch in tension compression or shear. The moving load to consist of three engines giving maximum possible load, followed by a uniform train load. Wind pressure of 50 lbs. per square foot on structure as a fixed load, and on train as an advancing load. An allowance for centrifugal force and for longitudinal force due to "braking" was specified. Other points were also referred to, notably that the proper stiffening of plate girder webs, and proportions of widths of main girder flanges, should be enforced.—In the discussion which ensued, Messrs. P. J. Waldram, H. Cartwright Reid, F. W. Hodgkinson, W. D. Williams, and J. Gilchrist took part; and the proceedings terminated with the announcement of the next meeting, May 18, when a paper on "A Short Review of the Motor Car Industry, Past and Present," would be read by Mr. Charles H. Rush and Mr. Basil H. Joy.

METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of the Managers of the Metropolitan Asylums District was held on Saturday afternoon, at the County Hall, Spring Gardens.

Rochester House.—The Asylums Committee submitted a report with plans for adapting the buildings at Rochester House, Little Ealing, for the accommodation of improvable children. The estimated cost of the work was 2,074*l*. The plans were adopted, and forwarded to the Local Government Board for approval.

Leavesden Asylum.—The Asylums Committee also submitted a plan for the conversion of a block at Leavesden Asylum into an infirmary block. The work was estimated to cost 124*l*., and it was proposed that it should be carried out by the asylum staff. The plan was adopted.

Southern Hospital.—The Works Committee submitted plans for the erection of the proposed Southern Hospital. They were adopted and forwarded to the Local Government Board for their sanction.

On the recommendation of this Committee, Messrs. Treadwell & Martin, architects, were instructed to prepare plans and specifications for a certain part of the building work, and it was resolved that they be paid a commission of 5 per cent. upon the erection of the same, and a commission of 2½ per cent. upon the total cost of the engineering works required in connexion with the equipment and completion of the Southern Hospital.

Tooting Asylum.—The Works Committee recommended that application be made to the Local Government Board for their sanction to the proposed scheme for the erection of receiving homes for imbecile children at Tooting Bec Asylum. The recommendation was adopted.

CHURCH CRAFTS LEAGUE.—The address of the newly-formed Church Crafts League, of which the Bishop of Rochester is President, is now at the Church House, Westminster. Lord Balcarres has joined the committee since the list was published. Mr. Ruskin had consented to become a patron of the league only a week or two before his death. The other patrons are the Archbishop of York, the Bishops of Bristol and Stepney, and Mr. G. F. Watts, R.A.

Illustrations.

PLAN OF THE PARIS EXHIBITION.

WE give this week a reduced copy of the official plan of the Paris Exhibition, on which, for the convenience of those of our readers who may be specially interested in the English exhibits, the position of all the English departments is indicated by shading added to the original plan.

The surface occupied by the Exhibition of 1900 is much more considerable than that of previous exhibitions. It comprises the whole of the Champ de Mars, the Trocadéro and surrounding gardens, the Quai d'Orsay, the Esplanade des Invalides, the Cours la Reine, and a large portion of the Champs Elysées. The superficies of the Exhibition of 1889 was 960,000 square metres, of which 290,000 square metres were occupied by buildings; the superfices of the present exhibition is 1,080,000 square metres, of which 460,000 square metres are occupied by buildings.

The Porte Monumentale, of which drawings and a short description have been given in the *Builder*, forms the principal entrance to the Exhibition grounds, and being nearest to the centre of Paris, it will be to this entrance that the visitor will most probably make his way. The building, the work of M. René Binet, architect, is placed on one side of the Place de la Concorde. It is composed of three immense arches placed on a triangular plan, carrying a spherical dome covering a surface of 500 square metres. The whole is highly decorated with plaster ornaments intermingled with panels of glass mosaic work and a large quantity of various coloured incandescent electric lamps, destined to produce a brilliant effect at night-time. Surmounting the principal arch facing the Place de la Concorde, above the curved pediment from which projects the prow of the vessel representing the City of Paris, is —at the moment of writing, at least—a very original piece of work by a young sculptor, M. Moreau-Vauthier, a figure of a woman dressed in the latest fashion of Parisian modes, representing the town of Paris welcoming its guests. This has not been approved, however, and is to give place to an ordinary finial. The building is constructed almost wholly of timber surrounded with decorative plaster panels and ornaments; the two lofty minarets are constructed of light ironwork. The dome covers thirty-six entrance gates so arranged as to allow the entrance of 1,000 visitors per minute. The interesting sculptured friezes decorating the lower portion of the façade and representing "Labour" are the work of a rising sculptor, M. Anatole Guillot. The frieze of animals is the work of M. Jouve.

The avenue leading from the Porte Monumentale brings the visitor to the two new Fine Art palaces which have already been described in the *Builder*, and the magnificent new avenue leading between these two buildings to the Alexandre III. bridge, and across this to the Esplanade des Invalides. The Petit Palais on the left, covering a surface of about 7,000 square mètres, is the design of M. Girault. The principal doorway in the centre of the façade gives entrance to a fine vestibule containing a large number of statues representing the schools of French sculpture up to the commencement of the nineteenth century. There are a number of works by Jean Goujon, Houdon, Coustou, Clodion, Carpeaux, Rude, and Etex. In the large rooms on either side of the vestibule are to be seen works by Watteau, Largilliere, Fragonard, Boucher, Gros, Troyon, Corot, &c. Other galleries contain objects of bronze, ceramic, iron, copper, &c., of various dates. One of the angle pavilions is preserved for old woven stuffs, the other for enamelled work. Other rooms contain various objects and works of art, such as furniture and carved woodwork. After the Exhibition the Petit Palais will become the property of the city of Paris and a State museum, the Municipality having given 20 million francs towards the expenses of the Exhibition on this understanding. The sculpture work in the spandrels of the doorways is due to M. Peynot. The figure in bas-relief representing Science over the principal entrance is the work of M. Carlés, who is also the sculptor of the charming bas-reliefs of children. The large panel over the principal doorway, representing the City of Paris surrounded by the Arts—the work of M. Injalbert —is worthy of note.

The Grand Palais opposite was built from the plans of three architects, MM. Thomas, Deglane, and Louvet. It covers a surface of 40,000 square metres. The central entrance, composed of three wide bays, flanked by figures representing on one side the Greek, Roman, Egyptian, and Byzantine arts, and on the other side the arts of painting, sculpture, architecture, and engraving, gives entrance to the wide hall occupying the whole length of the building, and destined to contain the annual Salons of painting and sculpture, and at other times the Horse and Agricultural shows. The fine frieze on the façade towards the Avenue d'Antin, representing the history of art from ancient times, and composed of ceramic bas-relief panels manufactured at the Sèvres manufactory, was made from the drawings of MM. Henri Blanc and Barrias, sculptors. The galleries surrounding the building will be occupied this year by works of painting and sculpture of all nations, and here will be found the works of paintings, &c., exhibited by the English artists. The cost of the two palaces has been about 25 million francs.

The avenue between these two buildings leads to the new Alexandre III. bridge, designed by MM. Cassien Bernard and Cousin, architects, and constructed of cast steel from the drawings of MM. Resal and Alby, engineers, the steel coming from the Creusot works. The bridge crosses the Seine in one single span of 350 ft. composed of fifteen steel girders, made in two pieces, joined by an articulated joint in the centre of the bridge. The bridge appears to be somewhat low, owing to the necessity of keeping the level of the roadway sufficiently low to avoid destroying the perspective of the Hotel des Invalides from across the river. The chief decoration of the bridge consists in the lofty pedestals which flank it at each entrance. The seated figures before each pedestal represent, on the Champs Elysées side, France of the Middle Ages, by M. Lenoir, and France of modern times, by M. Michel. On the Invalides side the figures represent France during the Renaissance, by M. Coutan, and France under Louis XIV., by M. Marqueste. Surmounting each pedestal are groups of Fame and Pegasus of gilt bronze. Four lions led by children, the work of the sculptor Gardet, decorate the two entrances to the bridge.

Crossing the bridge, we come to the Esplanade des Invalides, which has been covered with buildings of all description, some of very doubtful taste as regards design and colour. A wide avenue, allowing a view of the Dome des Invalides, has been left between the principal buildings. The buildings entitled Les Palais des Manufactures Nationales, designed by MM. Toudoire and Pradelle, architects, cover a surface of 12,000 square metres. They will contain the exhibits of various artistic work manufactured at the national manufactories, and all kinds of exhibits concerning the decoration of public and private buildings and dwellings, including furniture and various industries pertaining to the decoration and furnishing of dwellings and public buildings. The whole of these buildings and the avenue between will be brilliantly lit in the evening. The large painted allegorical panels decorating the walls of the façades nearest the river are the work of MM. Auburtin, Baudouin, Chabas, Vauthier, and Paul Buffet. The pavilion to the left when facing the Dome des Invalides, contains the tapestries from the National Manufactory of Gobelins. The exhibits will be divided into the following sections, going towards the Invalides: decoration and furniture of private and public buildings, decorative glass-window work, wall papers, furniture for ordinary and rich dwellings, tapestries of various sorts ceramic work, crystal and glass, apparatus for ventilation and heating, lighting apparatus. In the sections of various industries are exhibits of paper; cutlery, goldsmiths' work, jewellery, watchmaking, bronze and iron art work, and various small industries. The buildings on the other side of the avenue contain, first, in the portion nearest to the Hôtel des Invalides, the work from the Sèvres manufactory, and further on the various exhibits of foreign countries, similar as regards classification to those in the French section on the other side of the avenue. An important place has been given to the British exhibits in this building. At the back of these two lines of buildings are a large number of small pavilions, some of them put up by private enterprise, and nearly all containing exhibits of interest.

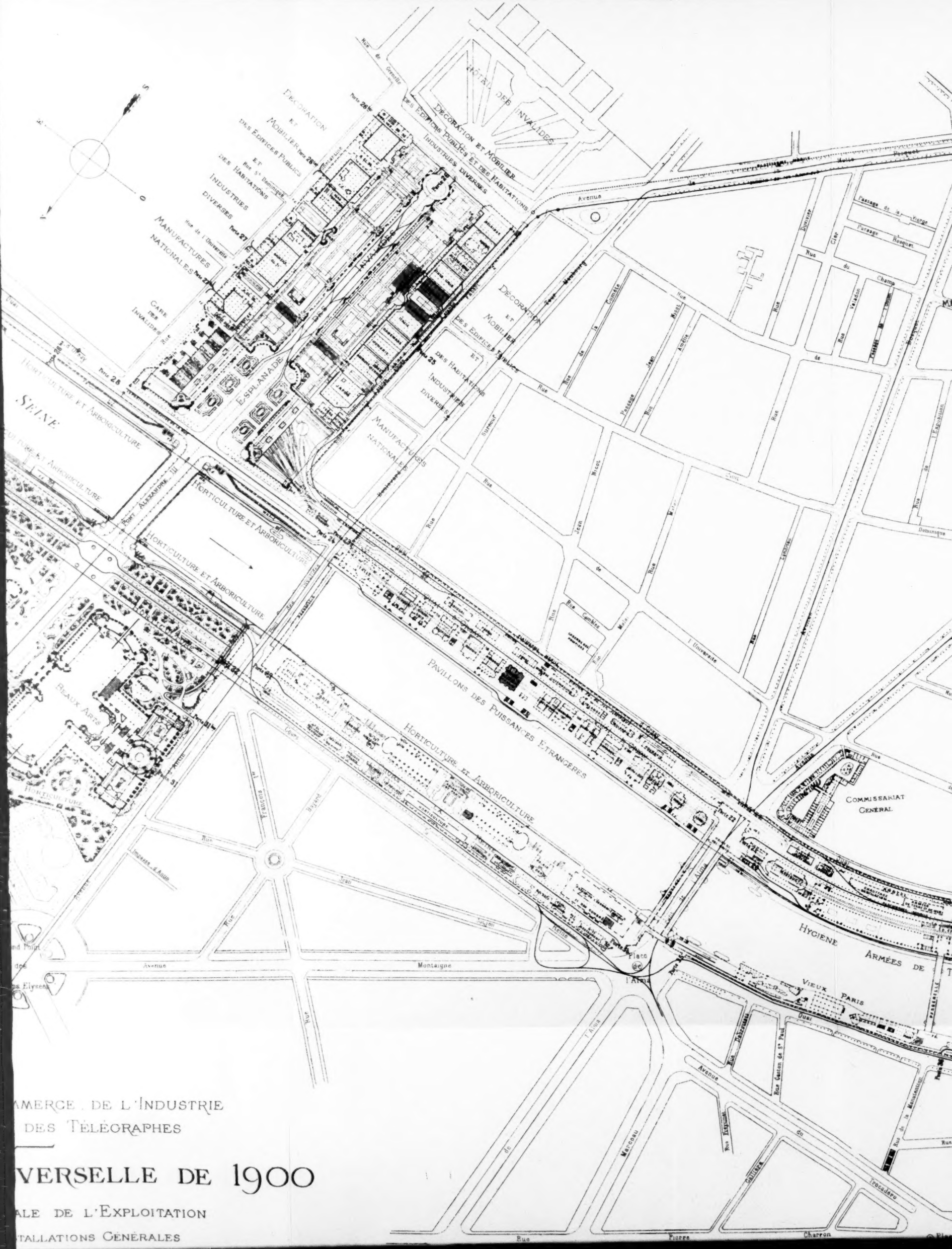
The avenue turning at right angles from the bottom of the Esplanade and the entrance to the Alexandre III. bridge leads the visitor along the quay to the Rue des Nations, as the quay side containing the many buildings representing the characteristic architecture of each nation is called. Nearly all the States of any importance have erected here a pavilion representing the style of the architecture most characteristic of their country. Seen from the river the effect of the line of buildings is very fine, but the visitor walking along the quay amongst the buildings will find that they are too crowded together to allow any of them to be properly appreciated. First of all, to the left, on entering the avenue, is the Italian pavilion, a very florid building of fifteenth century style. The Turkish pavilion follows, and is characteristic in style. It is followed by the immense and severely classical building of the United States. The next building, representing Austria-Hungary, is composed of a reproduction of a number of old Hungarian buildings, unfortunately arranged in a rather unhappy manner as regards the transition from one reproduction to the other. The Royal pavilion, officially representing Great Britain, comes next. It is partially a reproduction of Kingston House at Bradford-on-Avon, but the architect, Mr. Edwin Lutyens, has modified various portions and designed others in order to bring out as much as possible the characteristics of English domestic architecture of the sixteenth century. The interior of the pavilion is decorated in a very rich manner by various English firms. This is the only building along the quay constructed entirely of iron. All the other buildings are built chiefly of timber, with iron here and there. As the Royal pavilion is destined to contain paintings of immense valuet lent by several owners of pictures by the old masters, it was decided to avoid all danger of fire by building the whole entirely of iron embedded in plaster. The Belgian building, next to the Royal pavilion, is a reproduction, to a smaller scale, of the Town Hall of Audenarde. The Norwegian building following is an interesting specimen of the style of the country. The building representing Germany next along the line is a florid example of German architecture of the sixteenth century. The interior is very richly decorated and contains works of painting from the Imperial collection at Potsdam. The pavilion of Spain is one of the most elegant of the number; it is designed in a very pure Spanish Renaissance. The buildings following represent Monaco, Sweden, Greece, and Servia. The various buildings on the other side of the same avenue represent the several minor States. Some of them are very interesting as specimens of style and construction.

The footbridge at the end of the Rue des Nations crosses the public road at one end of the Pont de l'Alma, and leads the visitor to another portion of the Exhibition devoted to buildings containing exhibits relating to arms and war. The principal building on the quay side is that of the Palais des Armées de Terre et de Mer, an immense construction having a façade 340 mètres long and designed in a more or less Mediæval style. This building will contain all the formidable apparatus of war, and each nation has its own section set apart for its special exhibits. The various smaller buildings behind this palace, all in the styles of the nations they represent, contain exhibits pertaining to war on land or sea, means of defence, &c.

The avenue between these buildings leads the visitor to the Champ de Mars; from under the wide arches of the Eiffel Tower may be seen the whole view of the façade of the buildings situated in a long line on each side of the Champ de Mars, and at the end of these the immense decorative buildings of the Château d'Eau and the Palais d'Electricité. The first building on the left of the avenue after passing the Eiffel Tower is that of Mines et Metallurgie, followed by that of Textile Industries, cloths, tissues, and clothing, and further on by that of Mechanical Industries; the first of the large buildings on the right hand is the Palace of Instruction, Science, and Art, and following is the Palace of Civil Engineering and Means of Transport, and further on the Palace of Chemical Industries. These buildings contain in each section the exhibits of all nations, each country having a special section set apart. The *ensemble* of the Palace of Electricity and Water has been illustrated in the *Builder*, in an illustration taken from

MINISTERE DU COMMERCE, DE L'INDUSTRIE
DES POSTES ET DES TÉLÉGRAPHES

EXPOSITION UNIVERSELLE DE 1900



AMERCE DE L'INDUSTRIE
DES TÉLÉGRAPHES

VERSELLE DE 1900

ALE DE L'EXPLOITATION

TALLATIONS GÉNÉRALES

ECOLE MILITAIRE

Avenue de Suffren

Rue Fabert

Rue Vauquelin

Rue Pierre Nicole

Rue Duplex

Rue Desaix

Avenue de la Motte Picquet

Avenue de Lowendal

Avenue de la Bourdonnais

Avenue de la Rapée

Avenue de la Manutention

Avenue de la Tour Maubourg

COMMERCE, DE L'INDUSTRIE
S ET DES TÉLÉGRAPHES

UNIVERSELLE DE 1900

ÉNÉRALE DE L'EXPLOITATION
ES INSTALLATIONS GÉNÉRALES

D'ENSEMBLE

PLAN PROVISOIRE

HELLE DE 0m0005 P^R METRE

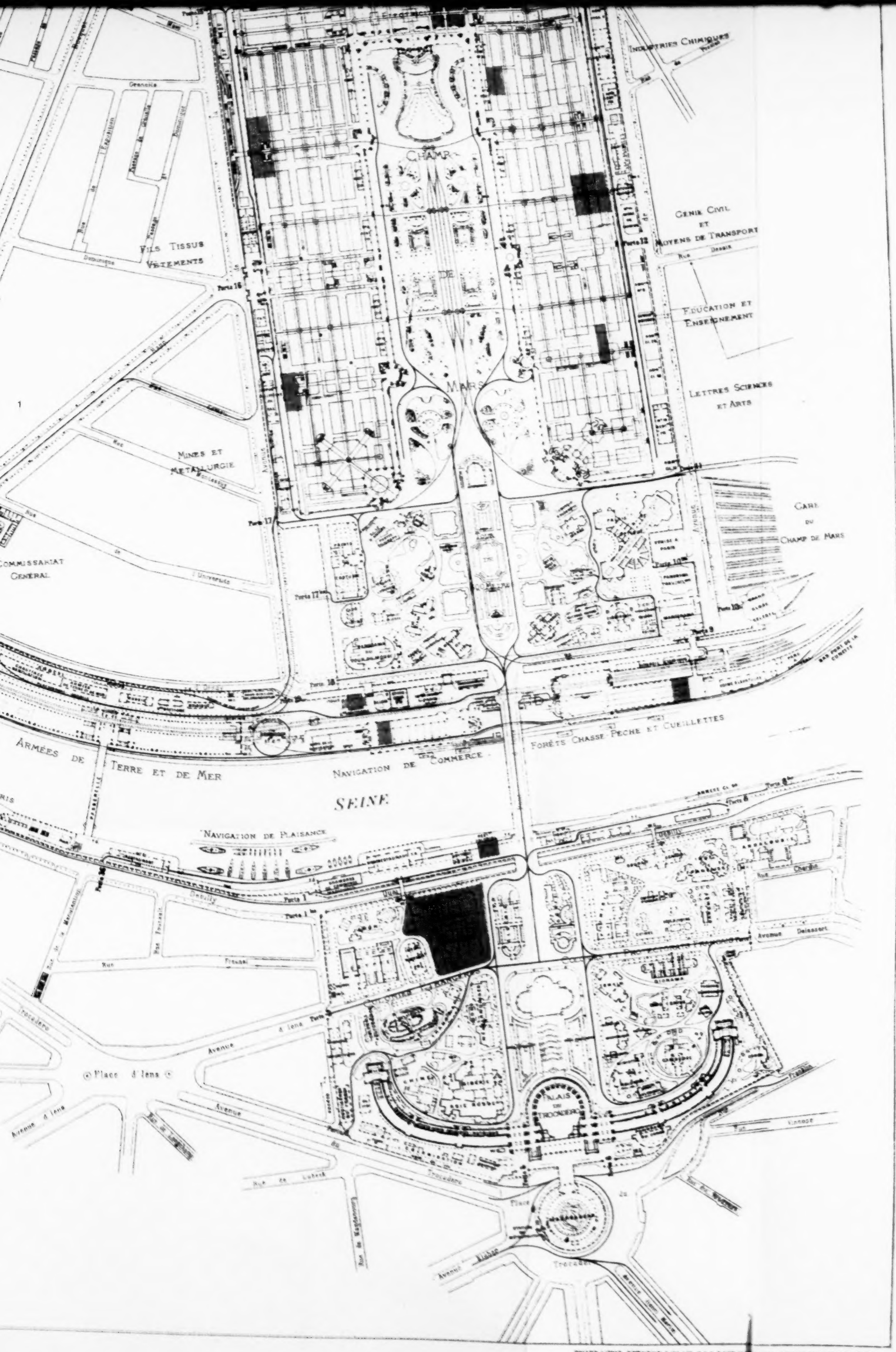
LÉGENDE

Voies ferrées de manutention

Voies charretières

PLAN OF THE PARIS EXHIBITION.

N.B.—THE PORTIONS OF THE BUILDINGS SHADED REPRESENT THE ENGLISH SECTIONS.


CHAMP DE MARS
INDUSTRIES CHIMIQUES
GENIE CIVIL ET MOYENS DE TRANSPORT
EDUCATION ET ENSEIGNEMENT
LETTRES SCIENCES ET ARTS
VILS TISSUS VETEMENTS
MINES ET METALLURGIE
COMMISSARIAT GENERAL
CARE DU CHAMP DE MARS
ARMÉES DE TERRE ET DE MER
NAVIGATION DE COMMERCE
SEINE
NAVIGATION DE PLAISANCE
FORÊTS CHASSE PECHE ET CUEILLETTES
PALAIS DU TROCADERO
Place d'Iena
Avenue d'Iena
Avenue Rapp
Avenue Bosquet
Avenue Labourdonnais
Avenue Dutuit
Avenue Delcasse
Rue Chaillot
Rue Fresnel
Rue de Constantine
Rue de Lubeck
Rue de Magdebourg
Rue Vineuse
Rue Pierre Guérin
Rue Boissière
Rue Dessaix
Rue de l'Exposition
Rue de l'Université
Rue de Grenelle
Rue Desaix
Rue Fabert
Rue Pierre Loti
Rue Jean Bart
Rue Jean Goujon
Rue Pierre Charron
Rue Vernet
Rue Galvani
Rue Duvernois
Rue Dupleix
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Rue Jean Rey
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Rue Jean Rostand
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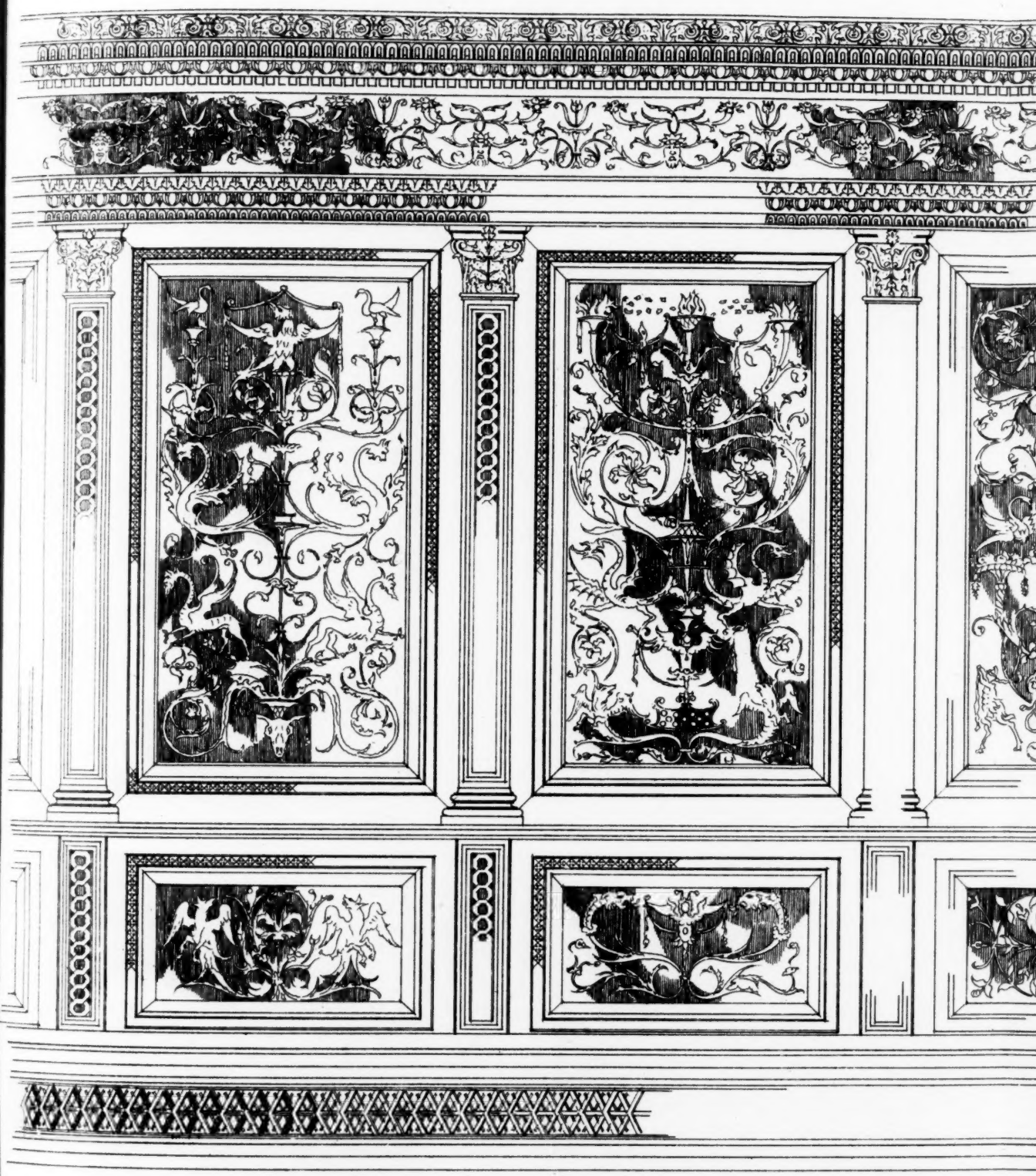

SCALE OF 12 9 6 3 0 1 2 3 4

PANELLING IN THE HALL OF THE OLD E

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city and Water has been illustrated
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PLAN

SECTION

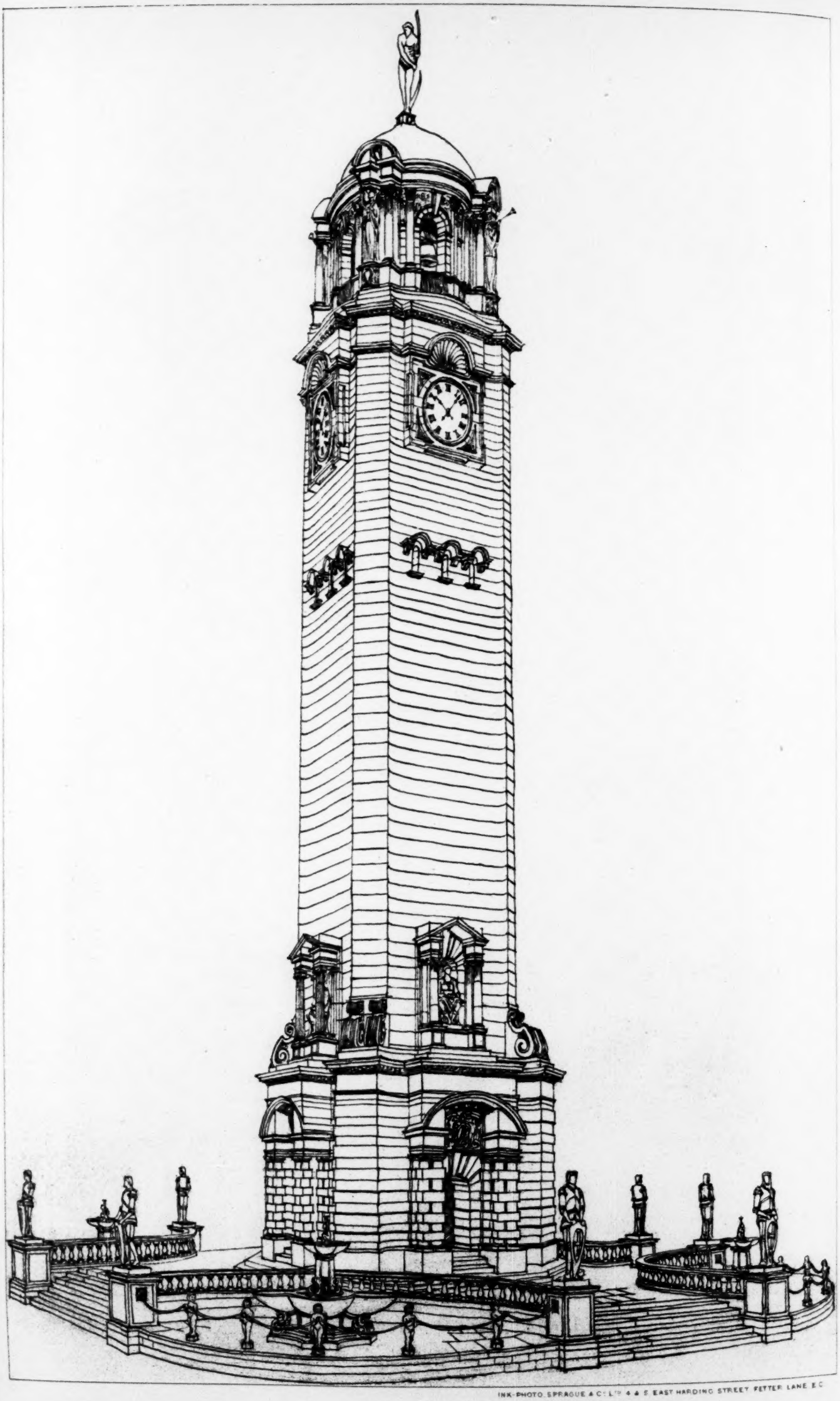
5 6 FEET

PHOTO-LITHO. SPRAGUE & Co. LTD. 4 & 5 EASTMARDING STREET, FETTER LANE, E.C.

THE OLD EXCHANGE, PERUGIA.—Drawn by Mr. Walter E. Dobson.

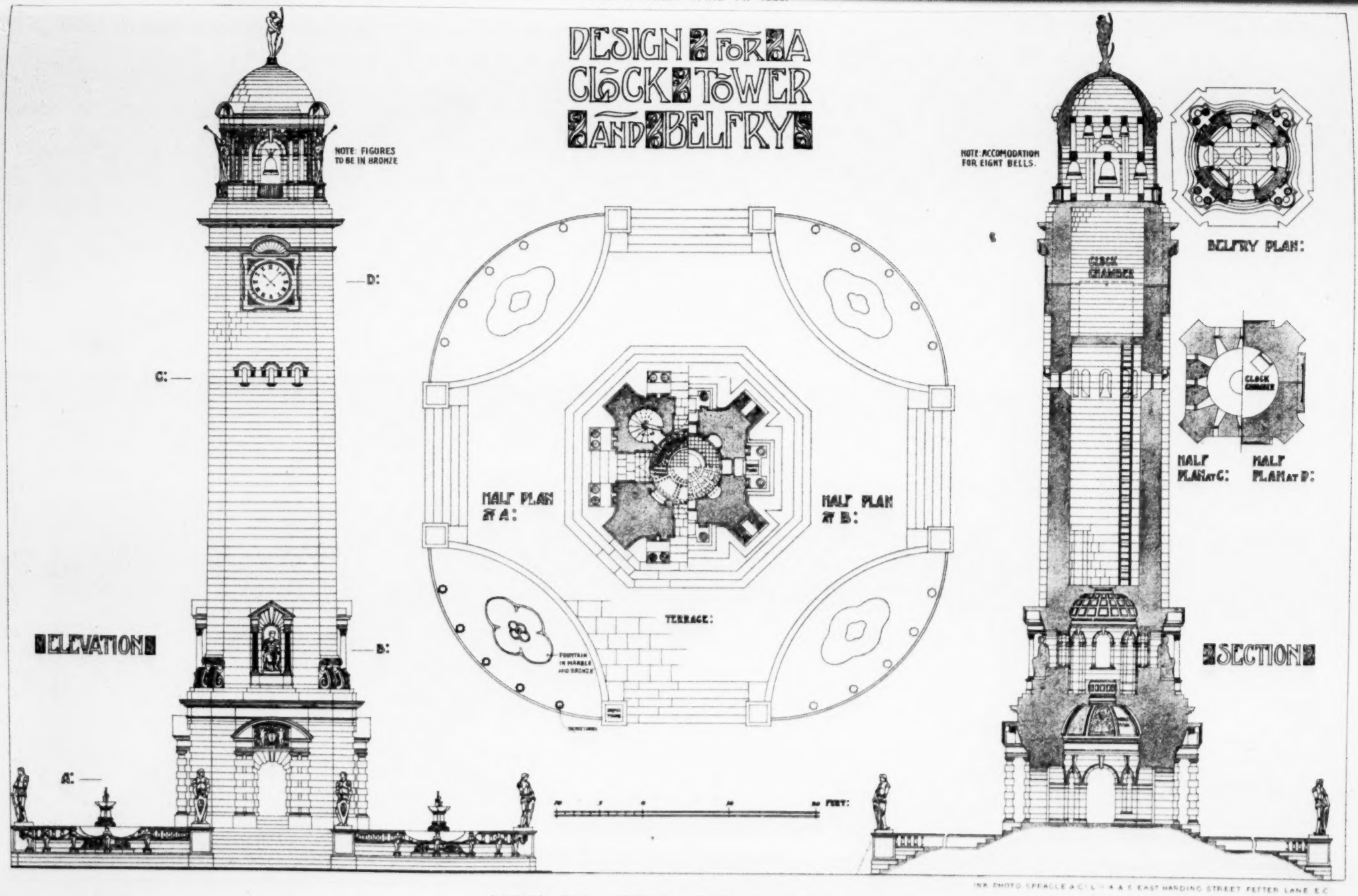
PHOTO-LITHO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

"GLENBRAE," NEAR NEWCASTLE-ON-TYNE.—Mr. E. W. Marshall, A.R.I.B.A., Architect.



INK-PHOTO. SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET FETTER LANE E.C.

DESIGN FOR A TOWER.—By Mr. F. J. Horth.
(COMPETITION DESIGN FOR THE TITE PRIZE.)



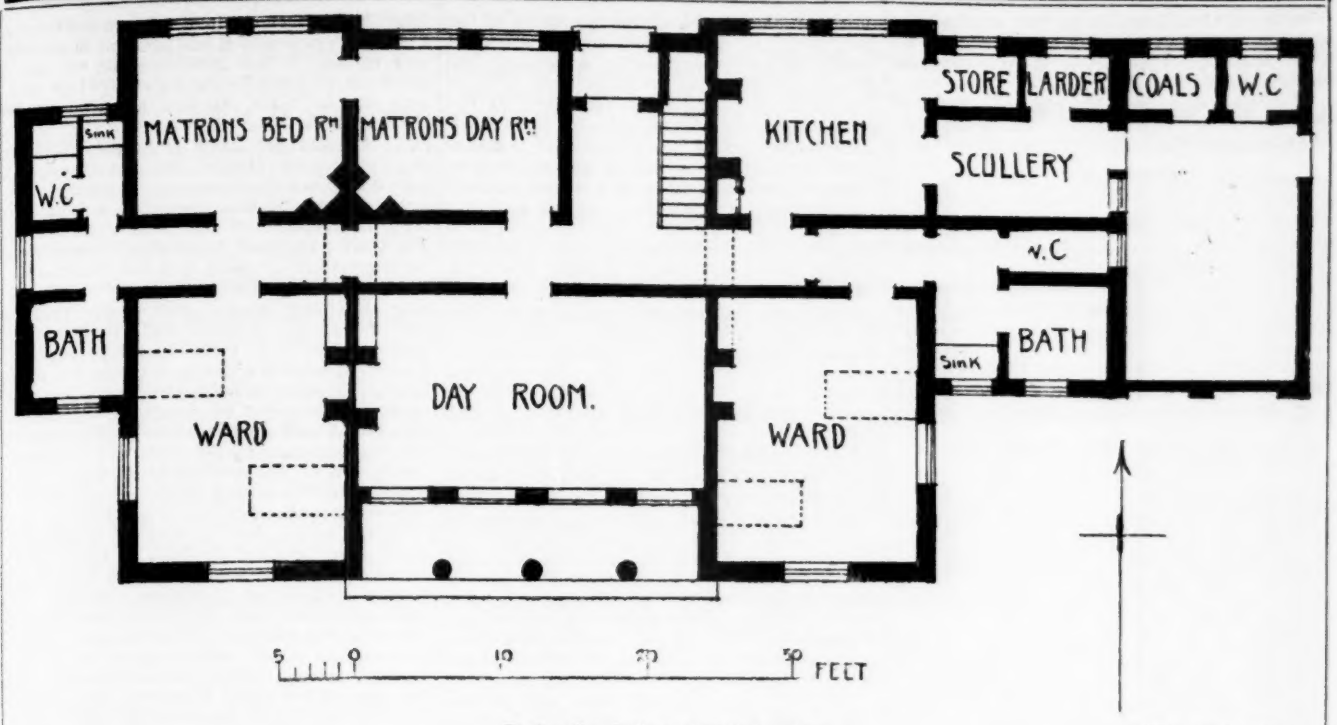
DESIGN FOR A TOWER.—By Mr. F. J. Horth.

(COMPETITION DESIGN FOR THE TITE PRIZE.)

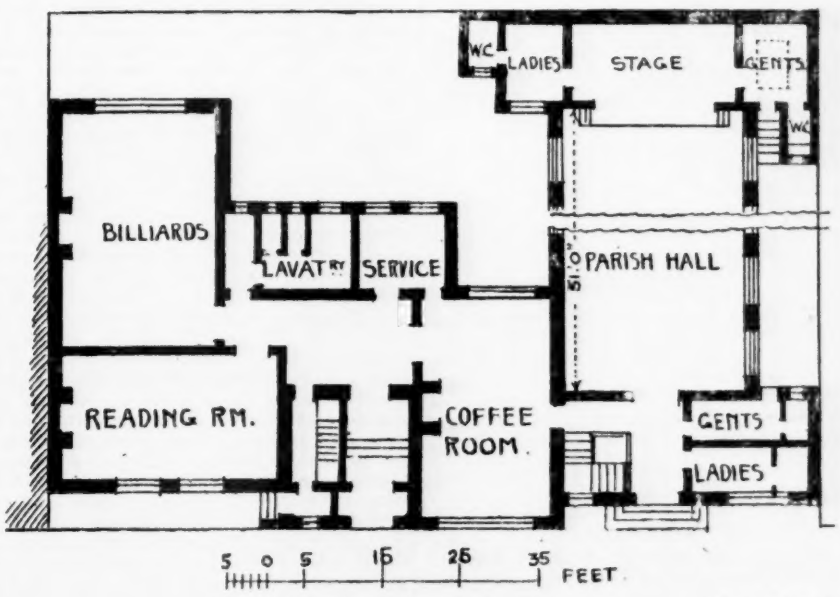
SKETCH FOR VILLAGE CLUB.—Mr. M. S. Hack, A.R.I.B.A., Architect.

PHOTO-LITHO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

DESIGN FOR A COTTAGE HOSPITAL.—Mr. M. S. Hack, A.R.I.B.A., Architect.



Design for Cottage Hospital. Plan. [See next page.



Sketch for Village Club. Plan. [See next page.

the model (*Builder*, October 21, 1899). The effect of these two buildings at the end of the Champ de Mars, when completed, will be imposing; the Palace of Electricity will be lit at night by 5,000 incandescent lamps of various colours, and a number of arc lamps with reflectors arranged to illuminate the whole of the façade. The Château d'Eau or Water Palace, M. Paulin, architect, will each day cast forth immense cascades of water, falling from the higher level of the wide arch in the centre to the level of the gardens below. In the evening the cascades will be illuminated. All this water will be pumped from the Seine to the upper portions of the Château d' Eau, and after its fall from the cascade will be employed for the boilers and condensers in the Machine Gallery, whence it will run back to the river. Behind these two buildings is a long gallery, the left hand portion of which will be occupied by various types of French engines and dynamos, and the right hand portion by the engines and dynamos of other countries, and here the English section is by no means the least important. The power given by all these engines is about 20,000 horse-power, of which about 15,000 will be utilised for lighting purposes and 5,000 for motive power. The gallery at the back of the Machine Gallery is to be occupied by various types of boilers of French and foreign make; the two lofty stacks at each end of this gallery, of a highly decorative design and 250 ft. high, carry away the smoke from the many boilers. The old Galerie des Machines has been destined this time to house the various exhibits of agriculture and food stuffs. The whole of the immense building is occupied by small buildings of most varied design, which will contain exhibits of various manufactured products of food and drink.

The long perspective of the Galerie des Machines, which excited so much admiration at the Exhibition of 1889, has been destroyed by the Salle des Fêtes, a circular domed building which has been erected in the centre of the hall. This Salle covers a surface of 6,300 square metres, and will hold 25,000 persons. The exterior and interior decoration has been executed by various well-known artists. The four immense painted panels of the dome are the work of MM. Cormon, François Flameng, Rochegrosse, and Maignan; the four smaller panels are due to MM. Eugène Thirion, Eugène Maillard, Gustave Surand, and Hirsch. This Salle, lit by 4,500 incandescent lamps, will be utilised for the great solemnities of inauguration, and the distribution of the awards to exhibitors. The architect of the Salle des Fêtes is M. Gustave Raulin.

The gardens in front of the Trocadéro Museum, across the Pont d'Iena on the far end of the Champ de Mars, are devoted to buildings representing the French colonies and those of other nations. The whole ground is so covered with buildings, large and small, that it will occupy the attention of the visitor for several days. On the front of the gardens towards the river side are the buildings representing the colonies of Great Britain, British India, &c.

On the river side opposite the line of buildings called the Rue des Nations, which has already been described, is first, at the end of the quay nearest the Pont de l'Alma, the large and somewhat plain building of the Palais des Congrès, followed by some very elegant iron buildings for exhibits of horticulture and arboriculture. At the other end of the quay is the pavilion of the City of Paris. Behind these larger buildings are a large number of small constructions erected by private enterprise—theatres, cafés, restaurants, and buildings of every imaginative design and idea.

The boats plying on the Seine will take the visitor right through Paris to the Vincennes portion of the Exhibition, devoted to sports and pastimes, cycles and motor-cars, and agricultural machinery.

PANELLING IN THE HALL OF THE OLD EXCHANGE, PERUGIA.

THE panelling here illustrated is in the Hall of Audience in the Old Chamber of Commerce at Perugia. The seating and panels are of walnut, inlaid with boxwood, the designs repeating round the room, and were executed by Domenicho del Tasso at the end of the fifteenth century. The walls above are decorated with frescoes by Perugino, representing the Seven Virtues. These, with the vaulted ceiling painted with arabesques and medallions, and the finely-toned woodwork of the panelling, money-changer's desk, and judicial benches, form a room charming for its wealth of design and rich, yet subdued, colouring.

WALTER E. DOBSON.

DESIGN FOR A CLOCK TOWER.

IN this design for an isolated clock tower, the main object sought was to produce an erection that should convey an idea of elegance, refinement, and dignity in construction. The material to be used is stone, to give an air of lightness and grace, it being intended for a sunny clime. The statuary in bronze would derive relief from its stone setting, and the fountains in marble would furnish a pretty contrast to the whole.

The design, by Mr. F. J. Horth, was submitted in competition for the Tite prize at the Institute, and deservedly attracted very favourable comment when the designs were exhibited, though it did not obtain any official award.

"GLENBRAE," NEAR NEWCASTLE.

THIS house stands overlooking Jesmond Dene on the outskirts of Newcastle. It is built of

Thurstonland red bricks in two shades—the dressings and plinth being of a darker tone than the rest; the roof is of Westmorland green slates.

The contractor was Mr. John Ferguson, of Newcastle; and the architect, Mr. E. W. Marshall, of London.

VILLAGE CLUB.

THE Club and Parish Room are arranged so that the latter may be used as part of the club premises or distinct from them.

In addition to the accommodation provided on the ground floor, there are on the first floor rooms for the caretaker, including a kitchen to serve also for club purposes; a lift leads from this to the service room. The building is to be faced with red bricks, stone dressings, and tile roof. Mr. M. S. Hack is the architect.

CONVALESCENT HOME.

THE home provides for six convalescents, there being two wards of two beds each on ground floor, and two single-bed wards on the first floor. The wards are contrived with separate bath and lavatory accommodation, in order that patients of both sexes may be admitted to the home at the same time.

The materials to be employed externally are rough cast for the walls, with red brick plinth and quoins, the columns and verandah to be in stone and the cornice wood. The roof to be tiled. Mr. M. S. Hack is the architect.

COMPETITIONS.

ORPHANAGE, CARNARVON. — The award of the assessor in the open competition for an orphanage to be erected at Bontnewydd, near Carnarvon, has been given. The plans of Mr. T. Taliesin Rees, architect, Birkenhead, have been placed first.

WESLEYAN CHAPEL AND SUNDAY SCHOOL, NEWTON-LANE, NEAR WAKEFIELD.—The designs of Messrs. Garside and Pennington, architects, for a new Wesleyan Chapel and Sunday school, at Newton-lane, near Wakefield, after a competition, have been accepted. The church is to be divided by arches, into nave, side aisles, with future transepts, organ chamber, and chancel on the ground floor, and pulpit on side of chancel. In the rear of the principal building will be a school-room, infants' room, and class-rooms, with kitchen, &c., in the basement. The buildings are to be in the Late Gothic style, with tower and future spire to the main road (Leeds and Wakefield).

SANITARY INSPECTORS' ASSOCIATION:

DAMP HOUSES.

AT the general meeting of this Association, held last Saturday at Carpenters' Hall, London-wall, the chief business after the election of new members and associates was the delivery of a lecture on "Damp Houses—Causes and Effects," by Dr. G. M. Lowe, M.D. (F.R.C.P., Edinburgh), Medical Officer of Health to the Lincolnshire County Council.

To the sanitary inspector, he said, upon whom the task of protecting the public health was in certain cases committed, the constitution of soils upon which dwelling-houses were built was a matter deserving of careful consideration. Among the chief causes of damp houses were wet soils, wet walls, and walls impervious to air. The nature of the soil underlying a house or place of business in which many hours of the day or of the night had to be passed, was necessarily of the highest importance. Soils naturally containing or conveying moisture, or composed of much vegetable or decaying matter, or soils very open or porous, and therefore capable of transmitting noxious gases and emanations from a distance, were at all times dangerous to health. When fires were lighted in buildings so situated, the interior air became rarified, and the colder and heavier external atmosphere pressed upwards into the house moisture and gases and such micro-organisms as the moisture contained. Porosity in soils was of great importance, for, while in a loamy soil moisture might be lifted as much as 36 in. by capillarity, clay broken into fragments as large as split peas would only allow it to rise from 5 in. to 12 in. A dwelling-house, as Mr. Turner put it, "is a sort of gigantic cupping-glass, and the rarified atmosphere of its rooms is continually replenished from the air stores of the soil, forced up siphon-wise by the excess of weight in the corresponding column of cold air outside." Several instances were given by Dr. Lowe of houses built according to the accepted rules laid down, and with no faults of construction (except the absence of a damp-proof course, or of a seal of impermeable or cleanable material, such as Portland cement) being extremely unhealthy. In one case, in a beautiful home, where the surroundings were delightful, the rooms, large, lofty, and well-lighted, there was always a damp feeling in the air of the interior, especially in the long passages on the ground floor, which were paved with stone slabs, resting on clay; the house had a succession of owners, driven off one after the other by ill-health. Here, said the lecturer, 6 in. of concrete would "lay the ghost" which had driven so many owners away.

Houses with walls impermeable to air were also damp. He knew of a hydropathic establishment in the north built of an impermeable form of concrete. In this huge building, the lecturer said, "every room is damp, except in the angle of one wing, where from settlement of the foundation a large crack through the outer wall, extending from basement to roof, wends its way. This crack has visibly been stopped up with ordinary mortar, and every room affected by it is dry." The painted walls of crowded rooms were frequently damp with moisture, condensed from the interior atmosphere, which was saturated with carbonic dioxide and aqueous vapour, exhaled from the lungs and skins of the occupants. From this hot and dank atmosphere men passed into the pure, cold air outside, and wondered at the feeling of lassitude, head-ache, and chill they experienced, and the catarrh that so frequently followed. Persons who spent most of their time in houses built over wet, alluvial or made soil, charged with watery and perhaps mephitic vapour, would exhibit its effects in a lowered vitality, a proneness to neuralgia, rheumatism, unaccountable colds and coughs, or a tendency to phthisis, enteric fever, and diphtheria. In former times, before the Lincolnshire fens were so perfectly drained and cultivated as at present, intermittent fevers and ague were rife with splenic enlargement as a prominent symptom, precisely as in malarial countries, and although, in his thirty years' extensive practice in and around Lincoln, he had not heard of a single case of ague, yet since the advent of the systematic use of the X-rays in medical work, he had found evidences of splenic enlargement. Quite two-thirds of the somewhat numerous cases of so-called dyspepsia occurring among clerks and younger foundry hands showed on the screen of the fluoroscope this splenic enlargement. Houses built over wet clay were damp and cold, and in course of time, particularly in old and ill-ventilated houses, the floor joists and roof timbers became saturated and rotten, and thus the emanation of decaying vegetable matters was added to the air, which the inmates had to breathe when the rooms were closed for the night. In such cases there was a tendency to catch any of the zymotic diseases that might be prevailing in the neighbourhood, and it was a question that was receiving much attention just now whether such houses might not become the permanent home of tubercle and even of cancer.

When once diphtheria, for example, got into an old house of that kind, there was no real cure but to pull the house down. The best remedy in such cases would be an accidental fire to break out when the residents were away at the seaside.

The obvious remedy for damp houses was to cut off the cause—

(1) By maintaining the porosity of wall and roofing materials so as to ensure free ventilation, and to construct windows that will open wide, near to the ceiling.

(2) By cutting off all ground air and moisture by an impermeable layer of concrete or asphalt extended throughout the basement to the outside of the external walls.

A discussion followed on the resolution of thanks, which was proposed by Mr. Fairchild, and supported by Messrs. Ashdown, Moss-Flower (ex-Chairman), H. Alexander, and other members, and subsequently unanimously carried. Mr. Fairchild asked whether there was any connexion between diphtheria and dwellings built on refuse and made earth, or earth which had been at one time impregnated with manure. In his district (Clapham) diphtheria had broken out in dwellings built upon a site two years after it had been made up with shot refuse. When another estate on which hundreds, perhaps thousands, of pigs had been kept at one time, became a building site sixteen years later diphtheria again broke out. It could not come from the school, as there were no children on the plot attending a school in which there was any diphtheritic outbreak. The site was concreted, but the old layer of manure had not been dug out first. The houses appeared to be dry. There were no complaints of damp and no cellars.—Mr. Moss-Flower instanced the case of a house near Salisbury where, during the greatest part of the day, no smell could be perceived, and yet in the early morning, after all doors and windows had been closed for some hours, there was an intolerable smell. Getting up during the night to investigate matters, he had found that ground air was being drawn into the house during the night, and further investigation of the undersides of the flooring proved that filth from a neighbouring farmyard was being drawn in with the night air.

In responding to the vote of thanks, Dr. Lowe said the chief difficulty of the sanitary officer was with the owner, because the removal of the causes of dampness touched the owner's pocket. He cited from his own experience an owner of a different type, who had an excellent house pulled down on his (Dr. Lowe's) advice. The lecturer informed him that to pull the house down was the only real remedy for the insanitary evils that impregnated it. Unfortunately such landlords were rare.

ARCHITECTURAL FEATURES, HOLBORN TO STRAND STREET.

THE Improvements Committee of the London County Council submitted on Tuesday a long report as to the architectural features of the new street from Holborn to the Strand. The Committee had previously brought up a report on the subject, which report we printed in the *Builder* for February 24, but the consideration of the matter was deferred in order that the Committee might receive a deputation on the subject from the Royal Institute of British Architects. The deputation was received, the whole matter was reviewed, with the result that the Committee stated in their new report that they were now fully prepared to advise the Council on the matter. The first part of the report differs very slightly from what we printed on February 24, nor does the form of invitation to architects, though we print it herewith for convenience:—

Proposed form of invitation—

LONDON COUNTY COUNCIL.

London County Council (Improvements) Act, 1899, 62 and 63 Vict., cap. 266. Proposed new street from Holborn to the Strand.

i. In order to take some measures to ensure harmony of design in the architectural treatment of the buildings to be placed upon the frontages of the new streets in the Holborn to Strand improvement the London County Council has resolved to invite eight architects to submit designs for the elevations only, in order to obtain the best professional views of the artistic treatment of this great improvement.

ii. The elevations should be accompanied by the necessary explanatory block plans of the frontages proposed to be treated in connection with the improvement, fronting on the Strand and on the curved street proposed to be formed between Wellington-street and Clements-inn.

iii. The Council will pay a sum of 250*l.* to each architect who submits a design in conformity with the accompanying instructions.

iv. On payment of the above-named amount, each design is to become the absolute property of the Council, who shall be at liberty to make such use of the designs as it may see fit in connexion with the object detailed in the first paragraph: but it is the intention of the Council, before making use of any of the designs sent in, to seek expert advice thereon.

v. The Council will not be under the obligation to employ, or secure the employment of, any of the selected architects to carry out their designs, or in any other capacity, or to make any further payment beyond the amount before stated with regard to the designs: the before stated payment is to be considered final.

vi. The land upon which it is proposed to build is indicated by the red lines on the block plan of a portion of the proposed improvement to a scale of 88 ft. to 1 in., showing the general arrangement and the sites allocated for reinstatement of premises to be demolished. This arranged may be varied as

regards frontage, but no portion of the buildings must project beyond the black lines.

vii. The designs are to be in black lines only, without colour, with the exception of a light tint of Indian ink on the doors and windows.

viii. The drawings are to be in geometrical projection.

ix. The drawings submitted must include—

(*a*) An outline elevation, to a scale of 16 ft. to 1 in., of the frontage next the Strand, the triangular plot next Wellington-street, and of the two sides of the curved street between Wellington-street and Clements-inn.

(*b*) Elevations to a scale of 8 ft. to an inch of the half of the Strand frontage from the end next Wellington-street.

(*c*) Elevations to a scale of 8 ft. to an inch of the east and west sides of the triangular plot next Wellington-street.

(*d*) Elevations to a scale of 8 ft. to an inch of the north side of the curved street to the westward of the proposed main street leading to Holborn showing the arrangements of the salient angle.

(*e*) Sections to a scale of 8 ft. to an inch through the front walls of the several buildings showing the arrangement of the roofs.

x. The buildings may be 80 ft. high from the level of the pavement to the top of the principal cornice, attic, balustrade or blocking, with not more than two stories in the roof.

xi. The difference in level on the various façades may be dealt with by either ramped features or by taking advantage of the breaks which will occur where streets are intended.

xii. The ground floor may be 18 ft. high, the other floors not less than 10 ft. from floor to floor, with the exception of the rooms in the roof, which are to be 9 ft. high.

xiii. The pavement in front of the Strand frontage may be taken to be practically level, the gradient of the curved street will be 1 in 55 from the Charing-cross or western end, and 1 in 50 from the eastern end.

xiv. It may be desirable to treat the centre block of the crescent-shaped island as devoted to one building, the streets at the flanks of it being approached by arcaded footways with steps up towards the curved street on the north side, and by a carriage road from the end leaving the Strand.

xv. The materials to be employed in the elevations to be stone, marble, or granite. No other materials will be admissible.

xvi. It should be borne in mind that the buildings to be erected in connexion with the improvement may be intended for commercial purposes, but the architects in preparing their designs shall have regard to the possibility of the central portion of the site lying between the new crescent road and the Strand being used for the erection of a public building.

xvii. The designs should be drawn on sheets of double elephant paper, 3 ft. 4 in. by 2 ft. 3 in., connected if required to increase the length, and mounted on strainers, with margins 3 in. wide.

xviii. The designs, which will be publicly exhibited, are to be sent in addressed to the Architect to the Council within eight weeks of the date of nomination.

The report of the Committee then proceeds:—

"It will be observed that we have readily acceded to a request made to us by the Establishment Committee on February 21 by inserting words in Condition XVI. in regard to the possibility of the central portion of the crescent site being used for the erection of a public building.

We may mention that the deputation from the Royal Institute of British Architects who attended before us on March 14 strongly urged us to adopt suggestions as follows:—

(*a*) Eight architects should be invited to send in designs, four of whom should be nominated by the London County Council and four by the Royal Institute of British Architects.

(*b*) Each architect sending in a design should receive an honorarium of 150*l*.

(*c*) Not more than three designs out of the eight should be selected for execution.

(*d*) The site should be treated as so many building block say A, B, and C.

(*e*) The designs of the successful architects should be executed by them under the following conditions—(1.) The architects to provide all working drawings, details, and specifications, and (2.) Their remuneration to be at the rate of 100 guineas per 25 feet of frontage.

(*f*) The adjudication should rest with a joint Committee of three members, one to be appointed by the London County Council, one by the Royal Academy, and one by the Royal Institute of British Architects.

(*g*) A period of at least three months should be allowed the architects for the preparation of their designs.

(*h*) It should be suggested that a joint committee of the London County Council and the Royal Institute of British Architects should be appointed to elaborate the above points, and draw up the instructions to the invited architects.

During the conference the deputation suggested that the Council should withdraw the original condition to the effect that the Council would be under no obligation to employ a particular architect, and that the Council should agree to pay the architect whose design was selected one per cent. upon the cost of construction of the buildings. It was further suggested that in the form of invitation no reference should be made to any particular style of architecture, that it should be expressly stated to what definite purpose the central portion of the crescent site is to be devoted, and that a few amendments should be made in the conditions relating to details of plans.

All these suggestions have received our fullest consideration, with the result that we are unable to advise the Council to place itself under an obligation to secure the employment of a particular architect after the designs are sent it. It is not clear to us that the Council, even if it so desired, could accede to this request. We have, however, as already stated, decided to advise the Council to pay 250*l*. for each design instead of 150*l*. as originally proposed. Moreover, we would point out that the fact of being amongst the eight selected architects will represent a considerable advantage to each of the persons invited to send in a design, and that though we cannot advise the Council to give any undertaking in the matter, there is little doubt that some if not all of the eight architects will be asked by the several lessees of the Council's land to prepare drawings for the elevations of their new buildings.

With regard to the suggestion of the Royal Institute that a joint committee of three members should adjudicate upon the designs, we must point out that in inviting designs we do not suggest a competition. It is possible that of the eight designs submitted no particular design will be selected for the whole improvement, but that several may be used. We think, however, that the Council may well be advised to undertake to seek expert advice before making use of any of the designs sent in, and we have accordingly added words to this effect to Condition iv. in the proposed form of invitation.

We may add that we have readily adopted the suggestions made by the deputation in regard to amending the conditions relating to details of plans, and have also prolonged the time allowed to eight weeks.

We have used every effort to reconcile the views expressed by the deputation from the Royal Institute with the conclusions at which we originally arrived, and we feel that the modified conditions in the form of invitation which we now suggest, and as set out above, concede as much as can reasonably be expected from us, having regard to our natural desire not to prejudice the interests of the Council. We communicated to the Royal Institute the modified conditions which we now submit to the Council for adoption, and in doing so we expressed the hope that these conditions would have the approval of the Institute. In reply, the Institute have informed us that they are "in entire sympathy with the London County Council in their desire to obtain a great municipal improvement, but that in order to secure harmony of design and good architectural character, they feel it to be essential to the success of the scheme that each of the intending tenants be required to go for the elevations of their new buildings to one of the finally elected architects; and they would further suggest that these architects might form a committee of advice for collaboration in the whole of the architectural scheme." We have already pointed out that in all probability some, if not all, of the eight architects will be asked by the several lessees of the Council's land to prepare drawings for the elevations of their new buildings. We believe that we have rightly judged the wishes of the Council in using every effort to secure the co-operation of the Institute in such an important architectural question as that dealt with in this report, but at the present stage we cannot advise the Council to commit itself to do more than that suggested in the modified conditions which we now submit.

We think that it is unnecessary for us to emphasise the fact that, having regard to the magnitude and importance of the improvement in question, which, as already stated, involves a gross outlay of nearly five millions sterling, it is absolutely necessary to obtain the best professional views of the artistic treatment of the improvement, particularly as by so doing the Council will realise the greatest possible amount for its land. The recommendations which we have to submit are accordingly as follows—

(*a*) That the estimate of 2,000*l*. submitted by the Finance Committee be approved, and that, in connexion with the Holborn to the Strand Improvement, eight architects be invited to submit designs for the elevations of the buildings proposed to be erected, fronting on the Strand and on the crescent road to be formed between Wellington-street and Clement's Inn.

(*b*) That the terms and conditions of the invitations be those set out in the foregoing Report of the Improvements Committee, and numbered i. to xviii. inclusive.

(*c*) That the Royal Institute of British Architects be invited to nominate four of the eight architects in question.

(*d*) That the Council do authorise the Improvements Committee to take all the necessary steps to give effect to the foregoing recommendations.

Mr. Cornwall, in moving the reception of the Report, said the Committee had been in communication with the Royal Institute of British Architects, and on most questions they agreed with the Institute. The only thing they had not agreed upon was that one particular design should be selected for the new street; but this would not disturb the friendly relations with the Institute.

Mr. Emden moved that the matter be referred back "for the purpose of obtaining a Consultative Committee instead of the suggested competition."

Mr. Bull seconded the amendment, which was defeated.

The proposed form of invitation was discussed, and Mr. Emden moved to add the words "terra-cotta or other suitable material" to the materials which might be employed.

Mr. Piggott seconded, and recommended the use of red and white bricks, or bricks with stone dressings.

Colonel Rotton spoke of the beauties of the Constitutional Club, which was faced with terra-cotta, and which compared very favourably with the marble of the Junior Constitutional.

The amendment was subsequently withdrawn in favour of another moved by Mr. Bond for the omission of the condition altogether.

Lord Ribblesdale thought the dignity and beauty of stone, as exemplified in Somerset House, would warn off architects against the use of terra-cotta in that neighbourhood. He was in favour of giving their imaginations as much play as possible, and would therefore vote against any limitation.

Dr. Longstaff said the Committee found that the principal architects were in favour of the limitation of materials which they proposed.

The amendment for the omission of the condition having been rejected,

Mr. Bond, M.P., said he saw no reason why they should lay any condition on the architect as to the material which should be used. They knew that in Italy some of the most charming structures were made almost entirely of brick.

Mr. Cornwall pointed out that the recommendation only referred to eight architects, and there was nothing to prevent the Committee considering other proposals.

Mr. Goulding, M.P., moved to include "bricks" in the materials which might be used, and this was carried.

Mr. Elliott moved, on Clause xvi., to omit all the words after "commercial purposes" from the clause, and said it was "an insidious move to get the thin edge of the wedge in" with regard to a new County Hall, and there was a good deal more in it than met the "open eye."

Colonel Ford seconded the amendment, and said there was a secret intrigue going on to get the County Hall on this site.

Sir John Hutton said he challenged the candour of the Vice-Chairman of the Committee to say there was no idea of having a County Hall on the site. He thought that candour was shockingly absent from the recommendation of the Committee.

Mr. Goulding, M.P., observed that when he voted for the Council's Bill in Parliament he understood that sooner or later a County Hall would be erected on one of the sites; but if they were going to build on the most important site, let them be upright and say so.

Mr. Shaw Lefevre said he had not yet made up his mind whether a new County Hall should be erected on a site in the new street or not; but it was certainly very inconvenient that such a matter should be settled on a side issue.

Mr. M'Kinnon Wood protested against the talk of a new County Hall being erected for their own benefit, because possibly few of them would be members of the Council by the time a new hall was built. He also objected to the amendment that day, which, if carried, would prevent them considering the site as a possible one for a County Hall.

The amendment was defeated, and the recommendations of the Committee as amended by Mr. Goulding's proposition was agreed to.

JOHN MILLARD MEMORIAL CHAPEL, BEDMINSTER.—On the 28th ult. the John Millard Memorial Chapel, Garnet-street, the Chessels, Bedminster, was dedicated. The building forms part of a scheme to erect a chapel, Sunday-school, and lecture hall at Garnet-street. The building which has been erected will be used as a chapel for the present, but is so constructed that it may be used as the school when the chapel proper is built. It is of brick, with Bath stone dressings, pitch-pine piers and dado, and wood-block floor about 40 ft. square. Mr. G. H. Oatley was the architect, and Mr. A. Dowling the builder.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring Gardens, S.W., Alderman W. H. Dickinson, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend the Poplar District Board 6,350*l.* for paving works; the Clerkenwell Vestry 1,610*l.* for decorative and other works to the Town Hall, and 6,500*l.* for paving works; the Hampstead Vestry 90,740*l.* for electric lighting and 218*l.* for street lighting purposes.

Protection from Fire, Central Works.—The Finance Committee recommended, and it was agreed, "That the estimate of 740*l.* be approved; that the work of providing an improved system for the protection of the Central Works from fire be carried out without the intervention of a contractor, and that the plan, bills of quantities, and specification be referred to the manager of works for that purpose."

New Theatre, Shaftesbury-avenue.—The Theatres and Music Halls Committee reported as follows, the application being agreed to on certain conditions:—

"We have considered nine plans, dated March 7, 1900, submitted by Mr. Lewen Sharp on behalf of Mr. H. Lowenfeld, in respect of a theatre which it is proposed to erect on a site in Shaftesbury-avenue, adjoining the Lyric Theatre. The building will have side and back frontages to Rupert-street and Archer-street respectively. The total length of the boundary of the site is 382 ft., of which 198 ft. abut on the streets above-mentioned, and 184 ft. on other property. It will thus be seen that the site has slightly more frontage to streets than is required by the regulations, but, on the other hand, one of the streets, namely, Archer-street, is 1 ft. below the regulation width (30 ft.) opposite the theatre, 1 ft. 7 in. below to the west. The theatre will have seating accommodation for 887 people, and in construction and general arrangement will comply with the Council's regulations. While satisfied that no danger to the audiences would arise from the contiguity of the proposed theatre and the Lyric Theatre, we thought it desirable to obtain the views of the Commissioner of Police on the question of the congestion of the street traffic which might result therefrom. He has informed us that the number of theatres in the vicinity causes great congestion of the traffic at night, which the police do their best to cope with, and that this they must continue to do, however much the traffic may increase, but that he does not feel in a position to make any suggestions that would be of use to the Council in coming to a decision on the plans. In the circumstances we recommend that Mr. Lewen Sharp be informed that, provided the works shown on the nine plans, dated March 7, 1900, submitted by him in regard to a theatre to be erected in Shaftesbury-avenue, Rupert-street, and Archer-street, are commenced within six months, the Council will be prepared to grant a certificate under Section 12 of 41 and 42 Vict., cap. 32, to the owner of such building."

Holloway Fire Station.—The Fire Brigade Committee recommended, and it was agreed:—

"That the estimate of 500*l.* submitted by the Finance Committee in respect of alterations and repairs at No. 84, Mayton-street, Holloway, be approved; that the tender of Messrs. J. Jarvis & Sons to execute for 485*l.* the work required to the premises be accepted; and that the seal of the Council be affixed to the tender in token of acceptance thereof."

Wireless Telegraphy.—The same committee recommended, and it was agreed,

"That, subject to the passing of the annual maintenance votes for 1900-1, the offer of the Wireless Telegraph and Signal Company, Limited, to instal and maintain for a period of two years, in consideration of an annual payment of 50*l.*, the necessary electric instruments to enable communication to be maintained between the street-station at Streatham-green and the temporary sub-station at No. 45, Mitcham-lane, Streatham, be accepted."

Advertisements in Tram-cars.—The Highways Committee submitted a report in favour of a readjustment of the advertising arrangements with regard to the Council's tram-cars, and recommending, among other things, that contracts for transparencies on the windows should not be renewed.

Mr. F. Smith moved an amendment that that point should be further considered. Otherwise, the Council would lose 1,500*l.* a year which was legitimately earned.

Mr. Steadman, M.P., seconded the amendment. He saw no harm in the advertisements in the cars.

Mr. Baker said the matter had been most carefully considered by the Committee, who found that the so-called transparencies darkened the cars and obstructed the vision of passengers.

Sir J. B. Maple, M.P., supported the amendment, and pointed out that they would have to carry 740,000 more passengers at halfpenny fares to cover the proposed loss of revenue from the transparencies.

After further discussion, the amendment was carried.

The report, as amended, was then adopted.

Lights on Tram-cars.—A discussion took place on a report of the Local Government Committee recording the decision on the appeal of the North Metropolitan Tramways Company, which required tram-cars to comply with the Council's by-law that every vehicle should carry a white light.

Mr. Baker, by way of protest, moved that the report be not received. He desired the Local Government Committee to revise the by-law, so that the old system of coloured lights in tram-cars might be restored.

Mr. Westacott seconded the amendment.

Mr. Webb, Chairman of the Committee, pointed out that tram-cars might still carry their distinctive coloured lights in addition to the white light. He declined to withdraw the report, or to promise any reconsideration of the by-law, which in his opinion ought to stand.

The amendment was carried, and the report was not received.

King John's-court, Limehouse, Scheme.—The Council agreed to contribute one-half the net cost of carrying into effect the King John's-court, Limehouse, scheme, under Part II, of the Housing of the Working Classes Act, 1890, such contribution not to exceed 8,150*l.*

Improvements.—The following recommendations of the Improvements Committee were agreed to:—

"That the estimate of 1,000*l.* submitted by the Finance Committee be approved, and that the Council do contribute on the usual conditions one-half of the net cost of the widening of Hoxton-street at Nos. 297 and 299, proposed to be undertaken by the Vestry of Shoreditch, such contribution not to exceed the sum of 1,000*l.*, it being understood that the Vestry shall continue the widening of the street from time to time as opportunities occur."

"That the estimate of 700*l.* submitted by the Finance Committee be approved, and that the Council do contribute on the usual conditions one-half of the net cost of the widening of Grange-road, Bermondsey, at Nos. 19 to 26, as shown upon the plan forwarded by the Vestry of Bermondsey, such contribution not to exceed the sum of 700*l.*"

"That, notwithstanding any previous resolution of the Council, the Council do give its consent to and do contribute on the usual conditions one-half of the net cost of the widening of the portion of Scrubs-lane lying to the south of, and forming an approach to, the bridge carrying the road over the main line of the Great Western Railway, the execution of the work to be arranged between the Vestry of Hammersmith and the Great Western Railway Company, and the Council's contribution not to exceed the sum of 200*l.*, and to be made subject to the width of the portion of the approach crossing the West London loop of the Great Western Railway, being increased to at least 45 ft. instead of to about 43 ft. as suggested by the Vestry."

Tenders.—The following recommendations of the Main Drainage Committee were also agreed to:—

"That the estimate of 975*l.*, submitted by the Finance Committee, be approved; that the tender of Mr. J. O. Richardson, amounting to 911*l.* 7*s.* 11*d.*, for the erection of dwellings for the accommodation of the staff at the Heathwall pumping-station, be accepted. . . ."

"That the tender of Mr. John Jackson, amounting to 361*l.* 17*s.* 9*d.*, for the repair of the river wall at the Barking outfall be accepted. . . ."

Holborn to the Strand Improvement.—Mr. Beachcroft inquired whether the Improvements Committee had yet considered what name should be given to the proposed new street from Holborn to the Strand. He suggested that as next year was the millenary of King Alfred, the Committee might consider the desirability of associating the name of Alfred with the new street.

Dr. Longstaff, Chairman of the Improvements Committee, said they had not yet considered the subject, but when they did so no doubt the suggestion of the hon. member would be considered.

The Council then considered a report of the Committee on the architectural features of the improvement. For the Committee's report and some notes of the discussion, see page 376.

Theatres, &c.—On the recommendation of the Theatres and Music Halls Committee, the following applications under the Metropolis Management Buildings Acts Amendment Act, 1878, were, on certain conditions, agreed to:—

Inner doors to entrance, Claylands Sunday Schools, Clapham-road (Mr. W. E. Davis).

Workrooms, &c., at the east end of Drury-lane Theatre (Mr. P. E. Pilditch).

Covered way on the east side of Picturesque England; Doll Exhibition in Picturesque England; and Glass Blowing Exhibition, to be held in the Royal Gallery of the Imperial Court at the London Exhibitions, Earl's Court (Mr. A. O. Collard).

Photographic Exhibition, Portman Rooms (Mr. F. Burgoyne).

Tramways and Light Railways Exhibition, Royal Agricultural Hall, Islington (Mr. R. Venner).

Lighting Approaches, Blackwall Tunnel.—The Bridges Committee recommended and it was agreed to sanction an expenditure of 624*l.* for supplying and fixing cables and lamp standards required in connexion with the electric lighting of the approaches to the Blackwall Tunnel, and to accept the amended tender of the British Insulated Wire Company for the work.

Factory and Workshop Acts, 1878 to 1895.—The report of the Building Act Committee contained the following paragraph:—

"Proceedings were taken by our direction under the provisions of Section 7 (1) of the Factory and Workshop Act, 1891, against Messrs. Hollington Brothers, the occupiers of the factory premises No. 9, Middlesex-street, for not keeping the factory in conformity with the Act of 1878, in that the factory was not furnished with a certificate from the Council that the premises in question were provided on the stories above the ground floor with such means of escape in case of fire for the persons employed therein as could be reasonably required under the circumstances of the case. The hearing took place at the Guildhall Justice-room on April 17, 1899, to which date the case had from time to time been adjourned, when the presiding alderman decided that the factory was not kept in accordance with the Factory and Workshop Act, 1878, but instead of inflicting a fine, he ordered, as he had power to do under Section 81 of the last-mentioned Act, that the defendants should, within three months, carry out certain alterations and works, which he specified, so that reasonable means of escape might be provided, and he declined to allow the Council any costs. We are of opinion that the alterations ordered by the alderman, and which have since been practically completed, are not satisfactory, and the question has arisen as to who should furnish the certificate as to means of escape required by Section 7 (1) of the Act of 1891, it being the duty of the Council to give such a certificate on being satisfied that the factory is provided on the stories above the ground floor with such means of escape in case of fire for the persons employed therein as can reasonably be required. As we are not satisfied upon this point, we are not prepared to accept on behalf of the Council the responsibility of issuing a certificate in respect of the premises. We have called the attention of the Home Office to the circumstances of the case."

Other matters were disposed of, and the Council adjourned for the Easter holiday until May 8.

BOOKS RECEIVED.

SPON'S ARCHITECTS' AND BUILDERS' PRICE-BOOK. By W. Young, architect. Twenty-seventh edition. (E. & F. N. Spon.)

MIDDLESBROUGH ASYLUM.—The Visiting Committee of the Middlesbrough Borough Asylum have approved of the preliminary plans by Mr. A. J. Wood, Surrey-street, Strand, for the enlargement of the asylum by 160 beds.

WESLEYAN CHURCH, THORNTON HEATH.—The memorial stones have just been laid of a new Wesleyan church, Thornton Heath. The building, which is being erected by Messrs. William Akers & Co., of South Norwood, is from the designs of Mr. Fredk. M. Ledger, Philpot-lane, E.C., is Perpendicular in style, and will be built of red brick and stone dressing. The principal front is towards Parchmore-road, and the chief entrances are placed at that end. Galleries will be provided, with access thereto by stone staircases. The internal dimensions are: Nave, 74 ft. by 28 ft.; side aisles, 50 ft. by 8 ft. 5 in.; and this, with sittings in the choir, will give seating accommodation for 400 persons, while the galleries will afford accommodation for 250 persons. The vestries measure, respectively, 9 ft. 10 in. by 13 ft. 10 in., and 13 ft. 6 in. by 14 ft. The present plan shows a corridor for connecting the church with the future school, about 14 ft. long, and also a heating-chamber and other requisite accommodation.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

At the meeting of the London County Council on Tuesday, the following applications under the London Building Act were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated :—

Lines of Frontage.

Hampstead.—That the application of Mr. J. Tomblin for an extension of the period within which the erection of buildings on the south side of Lyndhurst-road, Hampstead, was required to be completed, be granted.—Agreed.

Marylebone, East.—A conservatory and two wood and iron covered ways at No. 49, Acacia-road, St. John's Wood, at the corner of Ordnance-road (Messrs. R. H. and H. Kerr for Mr. G. Garet-Charles).—Refused.

Finsbury, Central.—Four-story buildings on the sites of Nos. 180 to 208 (even numbers only), Pentonville-road, Clerkenwell, between Winchester-street and Southampton-street (Messrs. R. Clarke & Parkes for Mr. W. H. Scott and Messrs. Lilley & Skinner).—Refused.

Width of Way.

Battersea.—Additions at rear of Nos. 28, 30, and 32, St. John's-road, Battersea, at less than the prescribed distance from the centre of a roadway leading out of St. John's-hill (Mr. J. Wallis Chapman for Messrs. Gardiner & Co., Limited).—Consent.

Formation of Streets.

Wandsworth.†—That an order be issued to Mr. R. C. T. Gordon, sanctioning the formation or laying out of three new streets for carriage traffic on the Garratt Park Estate, on the west side of Garratt-lane, Earlsfield (for Messrs. A. & J. Wise). That the names Gordondale-road, Turtle-road (in continuation), and Siward-road (in continuation) be approved for the new streets.—Agreed.

Hampstead.†—That an order be issued to Messrs. Farebrother, Ellis, & Co. sanctioning the formation or laying-out of a new street for carriage traffic to lead from Frognal-lane to West Hampstead-avenue, Hampstead (for Sir Spencer P. Maryon Wilson, Bart.). That the name Bracknell Gardens be approved for the new street.—Agreed.

Space at Rear.

Westminster.—That Mr. A. Blackford be informed, in reply to his request that the Council should declare that a strip of land at the rear of a site for the erection of residential flats at St. James's-court, James-street, Westminster, is secured permanently or to the satisfaction of the Council as an open space by covenant or otherwise, that the Council is not satisfied that the maintenance of such strip of land as an open space is secured in accordance with Section 41 (1) (iii) (*h*) of the London Building Act, 1894.—Agreed.

Whitechapel.—A modification of the provisions of Section 41 (1) (vi) of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of a mission-hall, with a reading-room and dwelling-rooms over, on the site of No. 189, Whitechapel-road, with an irregular space at the rear (Mr. W. A. Pite for the Rev. D. Baron).—Refused.

Deviation from Certified Plans.

St. Pancras, South.—Certain deviations from the plans certified by the District Surveyor, under Section 43 of the Act, so far as relates to the proposed rebuilding, with residential flats on the upper floors, of the "Apollo" public-house, No. 191, Tottenham-court-road, at the corner of Francis-street, on the sites of Nos. 191 and 192, Tottenham-court-road, and No. 19, Francis-street (Mr. C. F. Doll for Messrs. Ireland & Fitch).—Refused.

Separation of Buildings.

Bermondsey.—The formation, on the ground floor, of an opening in the party-wall between Nos. 215-217 and 219, Borough High-street, Borough, without making the buildings in conformity with Sections 74 (2) and 77 of the Act (Mr. T. W. Willis for Mr. F. H. Barker).—Consent.

Recommendations marked † are contrary to the views of the Local Authorities.

REREDOS, BARONY PARISH CHURCH, GLASGOW.—The memorial of his wife which Lord Newlands has erected in Barony Parish Church, Glasgow, was dedicated on the 5th inst. It takes the form of a reredos, but, strictly speaking, perhaps such a term should not be applied so far as the Church of Scotland is concerned, and the designer of the memorial describes it as being an ornamental treatment of the end of the church behind the communion table. The full effect of the design of the architect, Mr. J. J. Burnet, A.R.S.A., will not be seen until the figures, for which there are brackets on the original building, are placed on each side of the main window. The work has been carried out by Mr. Vicars, sculptor.—*Glasgow Herald.*

LONDON BUILDING ACT, 1894:

IMPORTANT TRIBUNAL OF APPEAL CASE.

THE Tribunal of Appeal under the London Building Act, 1894, sat at the Surveyors' Institution, Great George-street, S.W., on the 6th inst., to hear an appeal by Messrs. Francis Chambers & Son, on behalf of the Donkin Land Company, under Section 42 of the London Building Act, 1894, against the disapproval of and the refusal of the London County Council to sanction the plans of ten blocks of intended dwelling houses, to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, in a yard at the rear of Nos. 55 to 77, Southwark Park-road, Bermondsey, extending back to Cadbury-road.

The members of the Tribunal sitting were Messrs. Arthur Cates (chairman), A. H. Hudson, and J. W. Penfold.

The appellants were represented by Mr. Norman Craig, barrister, and the London County Council by Mr. Andrews, solicitor.

Mr. Norman Craig, in opening the case, stated that there was a great necessity for workmen's dwellings in the populous parts of London, and the attitude of the London County Council had always been to afford every facility possible to private builders. The property in question was now, and had been, used as an engineering works by the appellants but they were removing their works to Yorkshire, and it was proposed to utilise the site for the erection of workmen's dwellings. The plans submitted showed that it was proposed to erect ten blocks, six floors high, with 148 rooms on each floor, over the whole area, the rooms being divided into 58 sets of two and three rooms each. The erection would be of fireproof material, and the landings of each floor would not be closed, so that the ventilation would be ample. On February 24th, after the plans had been submitted, a letter was received from the County Council requesting to be informed upon what section of the Act the application was made, and the reply was sent intimating that Sections 41 and 42 were those affected. On March 14, a notice of disapproval was received from the Council, but no mention was made of the grounds upon which the refusal was made, and it only remained for the applicants to appeal to the Tribunal to find out. Explaining the plans, Mr. Craig pointed out that the different blocks were 25 ft. apart, and on the south side there was 20 ft. of free space. From the parapet to the pavement the measurement was 56 ft. 6 in., and the diagonal line, taken from 16 ft. above the pavement, would, he contended, clear the parapet. Dealing with the question of 16 ft. from the ground, Mr. Craig quoted Sections 41 and 42 which, he contended, gave them power to deal with the scheme as if the spaces were old streets; that was to say, it was enough for the Council to know that the amount of open space was equal to the amount which would have been necessary for them to provide, supposing they were building on an open street.

Mr. Frank Chambers, surveyor to the appellants, who was the first witness, said he had planned the building so that the diagonal line was drawn at a point 16 ft. from the pavement, and this would pass well clear of the top. He admitted that it was within the discretion of the Council to approve or refuse the application, and to insist upon strict conformity with the Act. He had prepared another set of plans showing how the building scheme would work out on lines strictly conforming to the Act. His original plan was, he contended, perfect, except on the assumption that the spaces were not streets within the meaning of the Act.

Mr. Andrews: The second plan is for argumentative purposes.

Mr. Wm. Edmond Wallis, surveyor to the Peabody Trustees, also gave evidence in regard to the requirements of the Home Office. They required an angle of 45 degrees from the footpath, so that the building in the front should not, in height, be greater than the space between it and the next building.

Mr. Andrews, for the respondents, reminded the Tribunal that the tendency of modern legislation had been to increase, rather than to lessen, the air space all round buildings. The Act of 1894, by Section 13, Sub-section 5, and by Section 41, sought to prevent persons who were building on a street from raising the structure to a greater height than that equivalent to the width of the street. This was amended in 1898, so that working-class dwellings were included in the operation of the provisions. Assuming the appellant required to build on these conditions, he would have to leave between the blocks spaces of from 20 ft. to 40 ft. The totals showed that the appellants would require a further addition to the existing two acres by 41 ft. The scheme was objectionable in every sense, and if proposed by the Authorities would never be sanctioned by the public departments without the Authorities being bound to put a street through the site and cut it up. He might suggest that apart from the question of light and air, serious difficulties would arise from fire, particularly in view of the fact that on the two acres there would, under the scheme, be housed 1,776 persons in 888 rooms.

Mr. John Hebb, from the Building Act Department of the London County Council, said the objections he found to the plan were as to the insufficiency of the width at the end of the blocks and the height, which exceeded the width of the ways between the blocks. In fact, the buildings would be something like twice the height that would be permissible if the building abutted upon a 25-ft. wide street. There were other defects. The planning of the building was certainly open to objection, but he did not think that was taken into consideration by the Council. That Authority declined to pass the plans because they did not comply with the Act in the matter of open space around the building. Moreover the plan upon which sanitary provisions were made was indefensible from a legal and sanitary point of view, so that if the Council had passed the plans the buildings would have been liable to have been stopped by the Local Sanitary Authority.

Dr. Young, Assistant Medical Officer of Health, also gave evidence upon the population and sanitary arrangements of the district.

In the result, the Tribunal dismissed the appeal with costs, the Chairman stating that the Tribunal could not take upon itself the responsibility of sanctioning so large a scheme, particularly as it did not comply with the Act.

Correspondence.

To the Editor of THE BUILDER.

LESLIE & CO., LIMITED, *v.* THE MANAGERS OF THE METROPOLITAN ASYLUM DISTRICT.

SIR,—Our attention has been called to the report in your issue of the 7th inst., *re* the above case, in which a statement appears to the effect that we had been guilty of delay in executing our part of the work. This statement is untrue, as we should have been able to prove had we been called as witnesses on the subpœnà served on us by the defendants. The statement, if left uncontradicted, is calculated to do us damage, and we therefore trust to your sense of fairness to insert this letter in your next issue.

Z. D. BERRY & SONS.

The Student's Column.

DETAILS OF STRUCTURAL IRON AND STEEL.

14.—BOLTS AND OTHER FASTENINGS.

ANY of the joints which have already been considered might be made by means of bolts or screws, and some of them could be made by pins. Bolts and screws are apt to become loosened under the influence of vibration, however tightly they may have been fixed at the outset. Therefore, friction of the plates or bars cannot be relied upon as an element of resistance in any joint formed in this manner. Simple pins are still more likely to become loose, whether they have been driven into tapered or parallel holes; and although they may be formed so that they cannot actually fall out, contractile force is never exercised upon the pieces of metal joined together. Further, the shank of a bolt, screw, or pin cannot fill the hole in a plate so completely as a rivet which has been closed up by hammering, or by heavy pressure in a rivetting machine. Finally, the cost of a bolt or screw is always more than that of a rivet, and some pins are more costly than bolts or screws. Nevertheless, there are often occasions when it would be inconvenient or impracticable to use rivets in the making of joints, sometimes because access for rivetting would be difficult, and at others because the length and diameter necessary far exceed the dimensions up to which rivets can be worked. Very frequently a bolt or a pin is intended to act as a pivot upon which one or more of the parts connected may move freely in a direction perpendicular to the axis of the bolt or pin. Here, of course, no other kind of fastening would be so suitable.

Bolts are made in various shapes, some of which are shown in figs. 86 to 92. The heads may be square, hexagon, cylindrical, or spherical, the shanks may be cylindrical throughout, or with square necks, and the nuts may be square or hexagon. The threads are usually triangular, as fig. 99, but when great strength is necessary, square threads, as fig. 100, are used. For girder and similar work choice is practically limited to the square and hexagon-shaped heads and nuts; counter-sunk bolts are occasionally necessary when projecting heads are not permissible; and bolts with cylindrical or with spherical heads are chiefly used in timber, being made with square necks so that the bolt shall be prevented from turning whilst the nut is being tightened up. The counter-sunk head with projecting square, fig. 92, is useful when

Fig 86. Fig 87. Fig 88. Fig 89. Fig 90 Fig 91 Fig 92 Fig 93. Fig 94. Fig 95. Fig 96. Fig 97. Fig 98. Fig 99. Fig 100.

Fig 101. Fig 102. Fig 103. Fig 104. Fig 105. Fig 106.

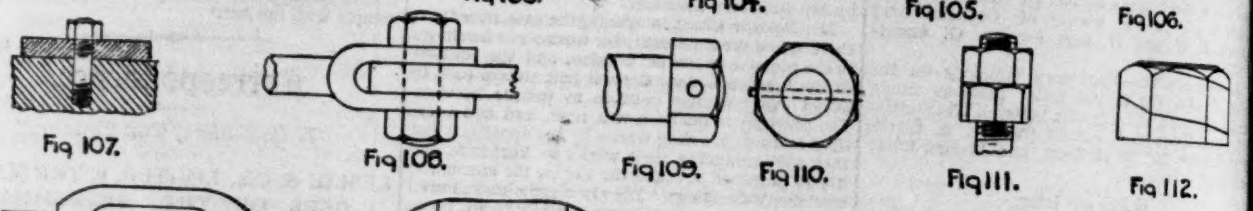


Fig 107. Fig 108. Fig 109. Fig 110. Fig 111. Fig 112.

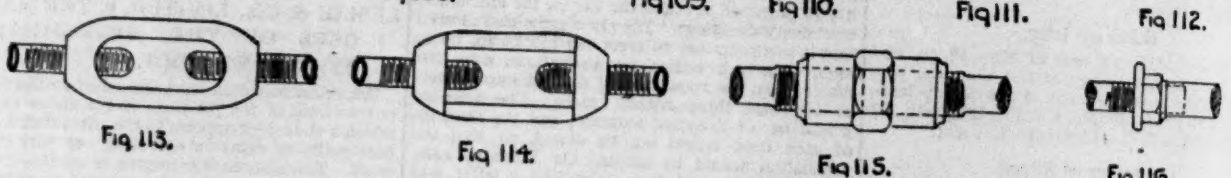


Fig 113. Fig 114. Fig 115. Fig 116.

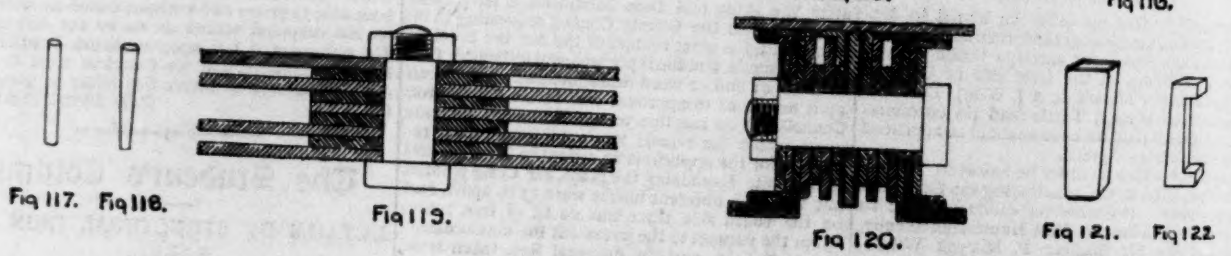


Fig 117. Fig 118. Fig 119. Fig 120. Fig 121. Fig 122.

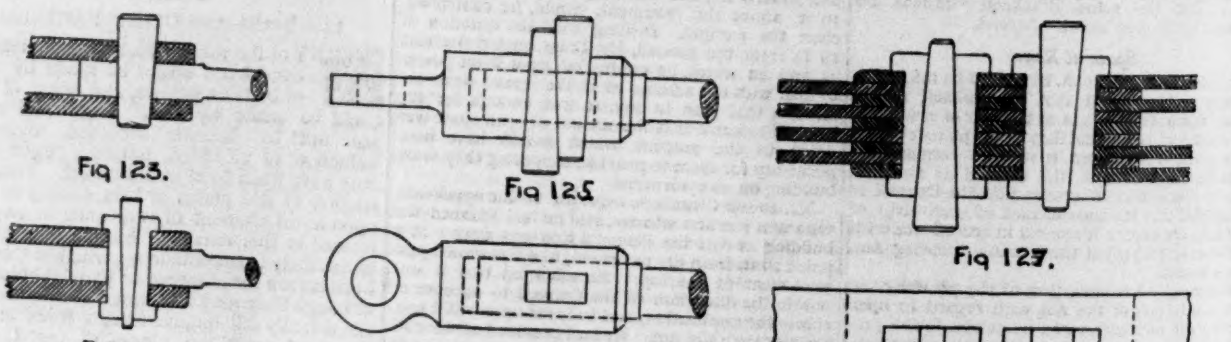


Fig 123. Fig 125 Fig 127.

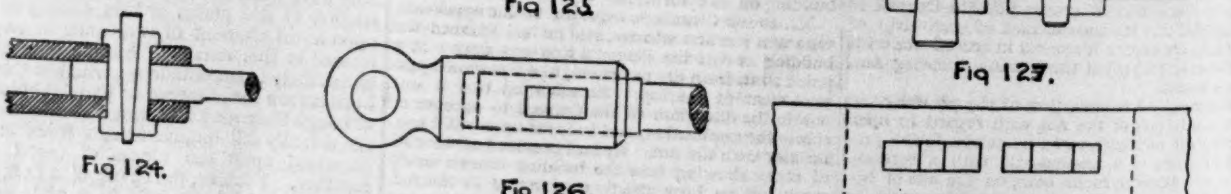


Fig 124. Fig 126. Fig 126.

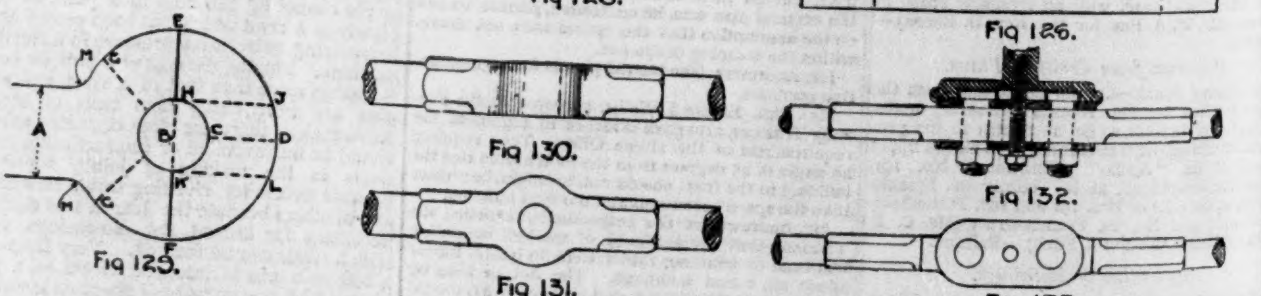


Fig 125. Fig 130. Fig 132.

Fig 131. Fig 133.

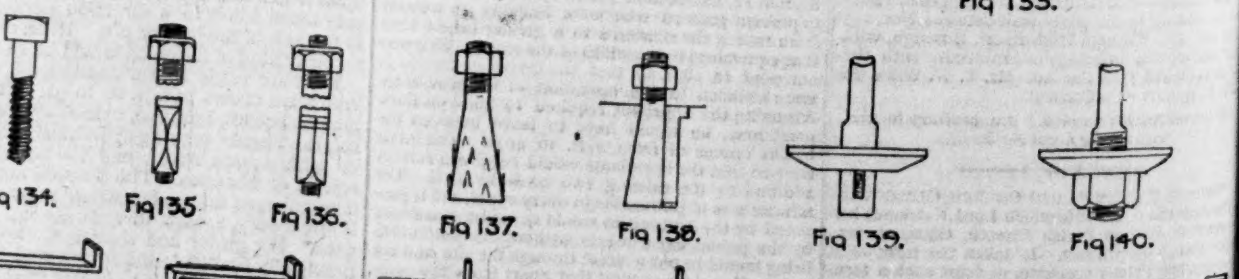


Fig 134. Fig 135 Fig 136. Fig 137. Fig 138. Fig 139. Fig 140.

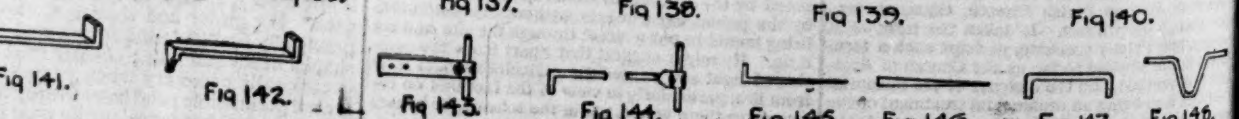


Fig 141. Fig 142. Fig 143. Fig 144. Fig 145 Fig 146. Fig 147. Fig 148.

Illustrations to Student's Column.

slotted head would be too light; the square d is screwed down by a spanner and erwards cut off. Set-screws, or tap-bolts, they are indifferently termed, are illustrated figs. 93 to 96, and are similar in construction ordinary bolts except that no nuts are pro-ded. Bolts are often required, as in fig. 97, that nuts may be fitted at each end; and metimes, for the sake of strength, the end of bolt is upset, or enlarged before screwing, as fig. 98. As a general rule, bolts are passed rough plain or clearing-holes, but in the case set-screws it is necessary that at least one of e holes should be threaded by means of a rew-tap. This forms what is known as a pping-hole. Various modes of applying bolts d set-screws are represented in figs. 101 to 8. The perverse tendency exhibited by nuts unscrew themselves is the cause of a good al of unnecessary worry to engineers. Many forts have been made to overcome the diffi-lty in a more refined manner than is presented by simply driving a pin through e nut, as in figs. 109 and 110, but no tirely satisfactory solution has yet been hieved. The familiar device of placing two uts at the end of a bolt, and of screwing one own upon the other, as in fig. 111, until jam-ing friction results, is not sufficiently reliable; any so-called lock-nuts are sold which in ality are only jam-nuts, as fig. 112, and no e has hitherto succeeded in placing a genuine ck-nut upon the market. Fig. 113 shows two e-rods, with right and left hand threads, rewed into an open drop-forged turnbuckle; g. 114 shows two tie-rods connected by means an arm-swivel; fig. 115 illustrates an quivalent arrangement, where the connector termed a pipe-swivel; and fig. 116 shows ow a tie-rod may be joined to a tubular bar.

Bolts and screws are liable to experience oth tensile and shearing stress in joints, but ins are only exposed to shearing stress. aking tensile stress first, we note that the sistance of a bolt is governed (*a*) by the nacity of the material, and (*b*) by the effective ameter. As the effective diameter of a rewed bolt is measured at the bottom of the hread, it becomes desirable that we should quire what are the proportions of bolts avail-ble for ordinary use. Fortunately, the appli-ation of Whitworth's standard to the dimen-ons of bolts and nuts is practically universal the present day. Table XXXIX. gives the andard dimensions for some of the most seful sizes of bolts and nuts. Bolts with quare threads have one-half the number of hreads used in the triangular form.

Table XXXIX. — Whitworth's Standard for Bolts and Nuts: Hexagonal heads and nuts, triangular threads.

Dia. of bolt.	Dia. at bottom of thread.	Number of threads per inch.	Thickness of head.	Thickness of nut.	Breadth across the flats.
inches	inches	threads	inches	inches	inches
¼	·186	20	·219	¼	·525
⅜	·295	16	·328	⅜	·709
½	·393	12	·437	½	·919
⅝	·508	11	·547	⅝	1·101
¾	·622	10	·656	¾	1·301
⅞	·733	9	·766	⅞	1·479
1	·840	8	·875	1	1·670
1¼	1·067	7	1·094	1¼	2·048
1½	1·286	6	1·312	1½	2·413
2	1·715	4½	1·75	2	3·149
2½	1·930	4	1·969	2½	3·546
2½	2·180	4	2·187	2½	3·894
3	2·634	3½	2·625	3	4·531

We can now proceed to find the safe load which may be imposed on a bolt, let us say, of 1 in. diameter. By Table XXXIX. the effective diameter = ·840 in., the area being: (·840² × ·7854) = ·5542 square inch. Taking the tensile strength of iron at 22 tons per square inch, and of steel at 28 tons per square inch, the ultimate strength of a 1-inch bolt would be 12·2 tons in iron and 15·5 tons in steel. Using 6 as the factor of safety, the working loads would be about 2 tons for iron and 2·5 tons for steel, equalling 3·6 and 4·5 tons per square inch respectively. The safe load for iron bolts not subject to much strain is frequently taken at 4 tons per square inch of the effective section; for bolts moderately tightened at 2 tons per square inch; and for bolts liable to severe strain after being very tightly screwed up at 1¼ tons per square inch. Long bolts, or tie-rods, should always have the screwed ends enlarged so that the effective area shall be equal to the area of the unscrewed portion. In well-proportioned bolts the resistance of the threads is fully equal to that of the bolt itself. During some experiments made by Brunel it was observed that most of the bolts broke at the base of the screwed part, and others, with enlarged ends, broke in the shank.

Whilst speaking of tensile stress, it may be just as well to remark that excessive strain is very often put upon bolts by the conscientious but mistaken efforts of workmen, who are apt to think their labours will be more satisfactorily performed if the nuts are screwed down as tightly as possible. This practice is very likely to lead to accidents, as, owing to the enormous mechanical advantage derivable from the screw, the strain put upon the bolt may easily be higher than the elastic limit of the material. We have already pointed out (in Chapter 5) the injurious effects of straining material beyond the elastic limit, and, generally, it may be said that when the parts which have to be connected by bolts are brought into close contact, and when the nuts have a uniform solid bearing against the surface, no further screwing down is necessary.

Shearing stress experienced by a bolt, when tightly fixed in position, is to be calculated exactly as in the case of a rivet, but, if the bolt be not held tightly in its place, stress will not be uniformly distributed throughout the sectional area, and its incidence will be governed by laws which relate to the distribution of shearing stress in beams. Its maximum intensity will then be greatest at the neutral axis, diminishing to zero at the top and bottom of the section. For example, if F = shearing action of the load at a given cross-section of the bolt, and A = area of the cross-section at which it acts, then $\frac{F}{A}$ = mean intensity over the whole section. The ratio in which maximum intensity exceeds mean intensity in the case of a circular bolt, or pin, = ⅓, and if the bolt is loosely fitted at first, or is likely to become so afterwards, the sectional area must be increased in this proportion. If shearing stress should be imposed upon the screwed part of a bolt, the effective, and not the nominal, diameter must be used in calculations.

A pin may be either a cylindrical or tapered peg, as figs. 117 and 118; or it may be a short shaft, a part of which serves as a journal, permitting movement of the parts joined in one direction. A pin of this kind is shown in fig. 119, having a nut, which cannot be screwed beyond the shoulder formed on the shank, so that lateral pressure shall not be exerted upon the parts connected; and the pin in fig. 120 is similarly secured. Tensile stress is never intended to come upon a pin of this kind, and the distribution of shearing stress is governed by the rules applying to bolts.

A cotter, key, or wedge is merely a tapered rectangular piece of iron or steel, as illustrated in fig. 121. Sometimes the cotter is simply driven into slots cut in the two parts to be joined, as in fig. 123; at other times one or two gibs, fig. 122, are used in conjunction with a cotter, as in fig. 124. Figs. 125 and 126 show two cotters employed together for connecting the ends of tie-bars in the roof of St. David's Station, Exeter, and figs. 127 and 128 illustrate the use of cotters and gibs, as applied to the ends of tie-bars in the roof of Lime-street Station, Liverpool. One of the chief advantages presented by cotters is that they furnish ready means for the regulation of tension. The angle of obliquity in a cotter should not exceed 4 deg., which is the angle of repose of iron upon iron, allowing for the accidental presence of oil or grease upon the surfaces. Cotters are only exposed to shearing stress, which will be equally distributed so long as the cotters are perfectly tight in their seats, and will be distributed in accordance with the laws relating to shearing stress in beams, if the cotters become loosened. The ratio in which maximum intensity exceeds mean intensity in the case of a rectangular key or wedge is ⅔, and if the contingency of slackness has to be encountered, due provision must be made by proportionately increasing the sectional area of the cotter.

Proportions of Eye-bars, &c.—When rods or bars are connected by bolts or pins, their ends are usually swelled out into the form of an eye, and it is rather important that the eyes should be of sufficient strength to resist the stress to which they will necessarily be exposed. The general proportions of an eye-bar are shown in fig. 129, and it is found that a joint into which such a bar enters, may fail in one of six different directions, namely:—

1. By shearing or bending of the bolt *b*.
2. By crushing of the link at *c*.
3. By bursting of the link along the line *c d*.
4. By tearing of the link along the line *e f*.
5. By tearing of the link through the shoulders, *g*, *g*.
6. By shearing of the link along the lines *h j*, *k l*.

With the exception of No. 5, all these alternative methods of failure are very similar to those described, in Chapter 11, as applying to ordinary rivetted joints; but the conditions here are so different as regards the distribution of stress, that the most suitable proportions for the eye cannot be determined theoretically. The following minimum dimensions are recommended by Mr. Berkley for wrought-iron flat eye-bars, the various parts of the eye being indicated in fig. 129:—

Width of bar ...	*a*	=	1·00
Diameter of bolt ...	*b*	=	·75
Depth beyond bolt hole	*cd*	=	1·00
Net width across eye	*ch* + *kf*	=	1·25
Radius of shoulders ...	*g g*	=	1·00
Radius of neck curves	*m m*	=	1·50

Figs. 130 and 131 are illustrations of the eye in the middle of a tie-rod, and figs. 132 and 133 show one method of connecting an eye-bar of this kind. Theoretical proportions are not observed in practice with regard to bars which are slotted for the reception of cotters. The simple practical rule is to make the sectional area of the bar, taken through the slot in the head, from 25 to 50 per cent. greater than the sectional area of the bar itself.

Although not used for making joints between metal and metal, there are some other forms of bolts and fastenings which may now be conveniently mentioned. Lag, or coach-screws, fig. 134, are very useful for attaching metal plates to timber. Expansion bolts, single and double, figs. 135 and 136, are for fastening ironwork to wall or other smooth surfaces. It is only necessary to have a hole of sufficient diameter and depth for the insertion of the bolt end. Expansion takes place when the head of the bolt is turned, and the bolt can be removed at any time without injury to the surface of the work. Fig. 137 shows a Lewis bolt, which also is secured by expansion. Fig. 138 is a representation of the ordinary rag-bolt, much used for the attachment of ironwork to stone, concrete, &c. Foundation bolts are sometimes made with a cotter through the end supporting the foundation plate or washer, fig. 139, and at other times the end is screwed and fitted with a nut, fig. 140. In either case the end should be swelled, so that the diameter is 1¼ times that of the remainder of the bolt. Ashlar anchors, figs. 141, 142, are useful ties for ashlar facing or for tying lining walls to main walls when air spaces are required. Beam anchors, fig. 143, are for securing girders, which rest upon walls, but angle brackets are frequently used for the same purpose. Hook anchors, fig. 144, are intended for tying a wall to timber beams parallel to the wall, and are also used to tie front, side, and interior walls. Drive anchors, fig. 145, are useful for connecting new brick linings to old walls. Wedge anchors, fig. 146, are used for making tight the junction between new and old work, when new foundation walls have been formed in an old building. A coping anchor is shown in fig. 147, and the V-shaped anchor, fig. 148, is used for holding girders, the loop being passed through a hole drilled near the end of the web.

OBITUARY.

MR. W. J. ANDERSON.—We regret to learn that Mr. W. J. Anderson died recently at Glasgow. Mr. Anderson was, as we stated last week, elected an Associate of the Royal Institute of British Architects in 1893. In 1888 he gained the Alexander Thomson Travelling Studentship, and visited Italy. Upon his return he published, in 1890, a volume of architectural studies in that country, illustrated with drawings and sketches he had made in the course of his tour. He contributed several articles to the Institute *Journal*, and wrote the article upon Melrose Abbey, published in the *Builder*, January 1, 1898 (out of print), as No. xxiv. of our illustrated series—"The Abbeys of Great Britain." In 1896 he published a work upon "The Architecture of the Renaissance in Italy," of which a second edition appeared in October, 1898, and was reviewed in our columns of October 28, 1899. In January-February last year he delivered a course of lectures at the

Glasgow School of Art upon "The Architecture of the Renaissance in France." We understand that Mr. Anderson lately undertook the preparation of a work upon the architecture of Greece as a complement of his volume, "Architectural Studies in Italy."

GENERAL BUILDING NEWS.

RENOVATION AND EXTENSION, TRINITY CHURCH, DARLINGTON. — The renovation and extensions which have been undertaken at Holy Trinity Church, Darlington, are almost completed. The walls and ceilings of the building have been painted, and the heating and lighting arrangements improved, the organ repaired, and a new clergy vestry has been built. The chancel has been lengthened by several feet, and the roof opened up to the apex, so as to enable the east window to be raised, and the platform, on which the Communion table stands, has been elevated by adding three steps. Additional light has been secured by the insertion of two windows on the south side. The church has been refitted with new clergy desks, choir stalls, reredos, and Communion table. A pulpit has also been erected in the nave, the steps being of Robin Hood stone, and the superstructure of oak, moulded and carved. A vestry for the clergy has been built at the north side of the chancel, and the entrance to the choir vestry altered, so that the clergy and choir will enter the church at the east end of the nave by a wide door, the pavement from it to the chancel being raised to the same level. The floor of the clergy and choir stalls has also been raised a step. In addition to the above work, the following gifts have been made: Brass eagle lectern, marble font, brass cross and flower vases, brass Communion railing, and Communion cloth. The whole of the work has been designed and superintended by Messrs. J. P. Pritchett & Son, architects, of Darlington, and the following were the contractors: Masons' work, Mr. Dodds, of Melsonby; slaters' work, Mr. Lancaster; joiners' work, Mr. R. T. Snaith; plumbers' work, Mr. Metcalfe, Darlington.

BAPTIST CHURCH, HUDDERSFIELD.—A new Baptist church has just been erected at Scapegoat Hill, Huddersfield. The building is 61 ft. long and 39 ft. wide, and has seating accommodation for 600 persons. The body of the chapel is divided by two aisles, which communicate with a vestibule 7 ft. 6 in. wide, at the front of the chapel. A gallery runs all round the building, and is approached by two flights of stairs from the vestibule, and another flight from the vestries behind the chapel. There are two vestries on the ground floor, and a large one on the east side of the chapel, having an external entrance and another from the vestibule. The whole of the internal woodwork is of pitch pine. The pulpit is of pitch pine, and stands within the communion, under which is a baptistry, built of white glazed bricks having an exit under the pulpit into the vestry. The ceiling of the chapel is divided into panels. The total cost, including furnishings, is expected to be 3,760*l*. The work has been carried out from the designs and under the superintendence of Councillor J. Berry, by the following contractors:—Masons, Messrs. A. & T. Haigh, Golcar; joiners, Messrs. E. Eagland & Sons, Slaithwaite; plumbers and slaters, Messrs. T. Allison, Limited, Milnsbridge; plasterer and painter, Messrs. Fred Singleton and B. A. Sutcliffe, Slaithwaite; concreter, Mr. John Cooke, Huddersfield; heating apparatus, Messrs. Tomlinson & Milan, Limited, Huddersfield; iron railing and grates, Mr. T. H. Rayner, Huddersfield. The new organ, which is included in the above estimate, has been built by Messrs. Peter Conacher & Co., Huddersfield.

FREE CHURCH, GLASGOW.—The foundation stone of the Nathaniel Stevenson Memorial Free Church was laid on the 7th inst. The church is situated on the bank of the Kelvin, at Belmont Bridge, and consists of a nave with apse at the east end, an aisle on the south side, and a transept to the north, divided from the nave by three arches. Below the church is a hall with session house, vestry, class-rooms, &c. At the north-west corner is a tower. The building is of red stone. The architect is Mr. John J. Stevenson, of London. Messrs. W. & J. Taylor, of Glasgow, executed the mason work, and Messrs. J. & G. Findlay, of Glasgow, the joinery.

CHURCH, CARDIFF DOCKS.—The foundation stones of a new Anglican church, which is to take the place of the iron structure in West Bute-street, Cardiff, were laid on the 5th inst. Mr. E. M. Bruce-Vaughan is the architect.

COALBROOKDALE CHURCH, SHROPSHIRE. — On Thursday last week the chancel of this church was reopened after being closed for alterations and decorations. The new large stained glass east window by Messrs. Heaton, Butler, & Bayne illustrates the subject of the Crucifixion, and was given by Mrs. Darby, in memory of the late Mr. Abraham Darby, who built the church in 1854. The general contractors have been Messrs. Branford & Sons and Messrs. Lloyd, of Ironbridge. New chancel pavements of encaustic tiles were made to the architect's designs by Messrs. Craven & Dunvill, and laid with steps and risers of Ashburton marble. The brass fittings were supplied by Messrs. Jones & Willis, the architect being Mr. Harbottle Reed, of Exeter and Cardiff.

BOARD SCHOOL, PENDLETON, NEAR SALFORD, LANCASHIRE. — The foundation stone was laid recently of London-street Board school, Charlestown, Pendleton, in course of erection by the Salford School Board. The architect is Mr. Henry Lord, of Manchester, and Messrs. A. R. Bullivant & Sons, of Moston, are the contractors.

ELECTRIC LIGHTING STATION, DONCASTER.—The new electric lighting station for Doncaster is situated in Gray Friar's-road, the frontage to which is 200 ft. in length. In the main building is the boiler-house, 101 ft. by 45 ft.; the engine-room, 101 ft. by 38 ft.; a condensing-room, 40 ft. by 36 ft.; a battery-room, 36 ft. by 38 ft.; and the fitting-shops, &c. The chimney, which is 150 ft. high and has a lining of fire-brick for 60 ft., rests on a concrete foundation 24 ft. square and 8 ft. thick, the cast-iron cap weighing 9½ tons. The buildings were designed by Mr. Crabtree, the Borough Surveyor, the electrical engineer having been Mr. Shoolbred, the Electrical Engineer to the Corporation. Messrs. Sprakes & Son were the contractors. The boilers were by Messrs. Tetlow Bros., of Oldham, and the dynamos were supplied by Messrs. Mather & Platt, of Salford. The current was switched on for the first time on the 2nd inst.

SHOPS, LEEDS.—Sixteen shops are to be erected on a site facing New Briggate and Cross Belgrave-street, Leeds. The architects are Messrs. Smith & Tweedale, of Leeds, and the following are the contractors:—Masonry and bricklaying, Mr. Paul Rhodes; joinery, Messrs. Craven & Umpleby; and ironwork, Mr. Leonard Cooper—all of Leeds. Mr. Henry Clarke is the clerk of works.

SCHOOLS, BIRKENHEAD.—The Birkenhead School Board have purchased a site for the erection of new Board schools in Woodchurch-road, Birkenhead, for about 1,000 children. They have appointed Mr. T. Taliesin Rees, architect, of that town, to carry out the work.

LISKEARD CHURCH TOWER.—The corner-stones of the new tower of Liskeard parish church were laid on the 4th inst. Three or four years ago steps were first taken by the parishioners to secure the legacy of 1,000*l*. bequeathed by the late Miss Anne Pedler, of Liskeard, for the rebuilding of the dilapidated tower provided the work was commenced within ten years of her demise (which took place in November, 1890), and failing this the money was to be devoted to Truro Cathedral Building Fund. After a controversy in which antiquaries and archæologists in many parts of the country took part, a faculty was obtained for the rebuilding of the structure, and, as the result of offering premiums of 50*l*. and 25*l*. for designs, those were accepted of Mr. John Sansom, architect, of Liskeard. This design, however, failed to receive the sanction of the diocesan authorities, as differing too widely from the old structure, and in order to meet their views the tower was reduced in size, the pinnacles at the summit were removed, and other alterations made Meanwhile, owing to the Borough Surveyor having condemned the tower as dangerous, a portion of the structure was taken down to prevent collapse, and the remainder was removed subsequently. The new tower will be about 80 ft. high. It is to be constructed in three stages, with a ringing chamber on the first floor and a bell chamber at the top. The ground floor of the tower will form part of the church, the old western door being inserted in the west wall, whilst the new tower arch will form an entrance. All the new dressings are to be of Cheesewring granite, and for the exterior facing up to the first stage the granite facings from the old tower will be utilised. Above this point a hard blue slate stone from Tencreek Quarry, near Liskeard, will be used. The interior walls of the tower will be lined with buff-coloured stone from St. Cleer. The old features of the former structure are to be preserved where possible; and the actual material from the old tower will be worked into the new building, including the old arch which formerly stood at the west end, the small Norman windows, and the ancient Norman arch, the stones of which were discovered used as walling in the old tower. At the base of the tower is to be placed a baptistry. It is hoped to provide a peal of eight bells, adding to the present peal of six. The summit of the tower will be battlemented, and at the north-west corner there is to be an octagonal turret with interior spiral staircase. Mr. G. Trehane, Liskeard, is the builder, the amount of the contract being 5,126*l*.

WORKING MEN'S CLUB BUILDING, CRESWELL, NOTTS.—A working men's club and lecture-hall, for the men engaged at the Creswell colliery, were opened on the 31st ult. The plans were prepared by, and the building has been erected under the superintendence of, Mr. Percy H. Houfton, of Chesterfield.

WESLEYAN SUNDAY SCHOOL, ALMONDBURY, NEAR HUDDERSFIELD.—Memorial stones were laid on the 7th inst. of a new Wesleyan Sunday School at Almondbury. The architect is Mr. B. Stocks, of Huddersfield.

HUDDERSFIELD ORPHAN HOME.—On the 5th inst. Mrs. F. W. Sykes, of Lindley, reopened the Orphan Home in Fitzwilliam-street, which has been undergoing extensive alterations. In the course of the alterations the old home has been entirely remodelled. The main entrance is from Fitzwilliam-street, through a vestibule with swing doors into a hall and stone staircase. On the left of the entrance is the matron's sitting-room and committee-room, and on the right are the girls' and boys' day lavatories. Between the two lavatories from the main entrance access is gained to the dining-room, which is 25 ft. square, and will accommodate fifty children. From the dining-room the lesson-room is approached, which is 22 ft. by 17 ft. Within easy distance of the dining-room and the matron's sitting-room are the pantry and kitchen. On the first, or chamber, floor is situate the girls' dormitory, 40 ft. long by 25 ft. wide, accommodating twenty-five beds. The boys' dormitory is over the lesson-room, and is approached by a separate staircase from the dining-room. It measures 25 ft. by 17 ft., and will accommodate seven beds. Between the girls' and boys' dormitories there is a private door for the matron's personal supervision. On the left of the main landing on the chamber, or first, floor is the matron's bedroom, and next to that comes the sewing-room and store-room. There is also a linen-room. At the end of this landing comes the isolation-room. Most of the rooms are warmed with hot water and lighted with the electric light. Outside there is a laundry. The various works have been carried out from drawings and specifications prepared by Messrs. John Kirk & Sons, architects, of Huddersfield and Dewsbury, under their personal supervision, by the following contractors:—Masons' work, Messrs. Moody Bros.; plasterers' work, Mr. T. B. Tunnacliffe; plumber's work and the electric lighting, Mr. Thomas Armitage; painters' work, Mr. Sam Kendall; slaters' work, Messrs. Pickles Bros.; concrete and macadam asphalting, Mr. John Cooke; warming, stoves, &c., Messrs. T. A. Heaps & Co., all of Huddersfield; carpenters and joiners' work, Mr. J. M. Moorhouse, of Meltham; and ventilating, Messrs. J. Bedford & Co., of Halifax.

ASYLUM, MIDDLETON-ST.-GEORGE, CO. DURHAM. —The private lunatic asylum which has been erected at Middleton-St.-George stands in the centre of the Middleton Hall Estate of 140 acres, and the look-out southwards is over the Tees Valley to the Cleveland Hills. The Hall has been adapted for Superintendent's residence, and new buildings for patients have been erected on each side, the hall separating the sexes. The licence is for 65 patients, but accommodation is at present provided for 50. The buildings, which have a frontage of over 400 ft., are built of local bricks, and covered with Dinorwic slates. The corridors are formed of Mark Fawcett & Co.'s patent fireproof flooring, and the whole of the ceilings next the roof are of concrete 5 in. thick. All the internal woodwork is stained with Marriott's green oil stain. All the rooms have open fires, and the corridors are heated by low-pressure steam. The lighting throughout is by electricity. The sewage disposal is by a simple form of bacteria tanks, the effluent being carried away by land drains. The foundations were put in by Messrs. Geo. Gradon & Son, of Durham, and the general contractor for the superstructure was Mr. Thos. Beetham, of West Hartlepool. The heating and hot-water supplies were carried out by Messrs. Ashwell & Nesbit, Limited, of London and Leicester; the electric installation by the Corlett Electrical Engineering Company, Limited, of Newcastle-on-Tyne and Wigan; the sanitary fittings throughout are by Messrs. Doulton & Co., Limited, of Lambeth; the special locks and hardware by Mr. N. F. Ramsay, of Newcastle; and the fireproof flooring by Messrs. Mark Fawcett & Co., of Westminster. The whole of the works have been carried out under the superintendence of Mr. John W. Dyson, architect, of Newcastle-on-Tyne, with Mr. Edward Armstrong as clerk of works.

SANITARY AND ENGINEERING NEWS.

NORTHUMBERLAND COUNTY ASYLUM WATER SUPPLY.—The Northumberland County Council have now obtained an excellent supply of water for their asylum at Morpeth, the contract for which has just been completed by Mr. T. Bell, of Market Weighton. The water is obtained from a copious spring on the moors at Doe Hill, in the Whittle Shield district, where a collecting chamber and storage reservoir have been constructed. From thence the water is conveyed for a distance of eight miles in 6-in. pipes to a storage tank on top of a tower 65 ft. above ground level. The mains are of cast iron and have all been tested in the trenches before being covered up, by hydraulic pumps to a pressure of 50 per cent. more than the working head, so that there is practically no leakage, as evinced from various tests since made. The mains are supplied with numerous stop, scour, and air valves. The spring can provide the present number of inmates with over 100 gallons per head per day, being greatly in excess of the gallons required by the Lunacy Commissioners, and is subject to little seasonal variation. The water has been satisfactorily examined, both chemically and bacteriologically, as well as to its action on lead. The whole of the works were designed by Messrs. Balfour & Son, of London and Newcastle-upon-Tyne.

STODDART'S IMPROVED SEWAGE-FILTER. — The new sewage-filter is the invention of Mr. F. Wallis Stoddart, F.I.C., F.C.S., and is described in a pamphlet issued from the office of the *Public Health Engineer*. The filtering material may be "coarse rubble, clinker, ballast, coke, or other material," the size of the particles ranging from 1½ in. to ¼ in. (as a minimum) ½ in. A concrete bed is laid

ceive the material, but it is suggested that walls re unnecessary, the natural slope of the filtering ubstance being utilised instead. The special merit f the invention is in the method adopted for dis- ributing the sewage over the surface of the filter in uch a manner as to avoid "ponding" either on the urface or in the body of the filter. This result is aid to be obtained by covering the filter with a "distributor" consisting of a series of V-shaped orrugations. A capital W represents two of these orrugations. The sewage enters the distributor nd passes through perforations in the upper ngles, flows down under the sloping sides nd drips from a series of points projecting from he *lower* angles. It is claimed that by this device "grounding" is avoided, and the filter always horoughly aërated, and consequently that the filter requires no rest, but can be continuously worked. If this claim be substantiated in practice, the in- vention will be worth the attention of sanitary uthorities, and will be particularly useful in the ase of small installations for houses, schools, and other buildings, where regular skilled attention is ot available. At the time of writing the report, a ilter of this kind had been working continuously at Horfield, near Bristol, since September 14, 1899, with apparent success, but it is yet too early to say that the advantages claimed by Mr. Stoddard have been fully realised by his invention.

New Railway Viaduct, Banffshire.—In order to improve the curves, the Great North of Scotland Railway Company have diverted the line between Avochie and Rothiemay a distance of 1¼ miles. In the new viaduct there is a double line of rails in- stead of a single one as in the old track. The river Deveron is crossed by a steel lattice girder bridge of single span of 200 ft clear on the square. There being a skew of 36 ft. 6 in., the two main lattice girders are each 212 ft. 6 in. long. These are 25 ft. deep, and braced with seven sets of diagonal cross bracing, the whole being covered with patent trough flooring rivetted to the top of the main girders. The main girders rest on cast-iron bedplates, 4 in. thick, having one end fixed, and the other end resting on steel rollers to allow for expansion and contraction. There is also a massive lattice girder handrail or parapet of steel, 5 ft. high, with oak cope. The steel work was carried out by Messrs. Findlay & Co., Motherwell, and, the necessary appa- ratus having been erected on the ground, all the rivetting was effected by hydraulic power at a pressure of about 900 lbs. to the square inch. The masonry of the new viaduct was executed by the railway company's own men. The whole of the works were designed by, and have been carried out under the superintendence of, Mr. Patrick M. Barnett, engineer-in-chief to the G.N.S. Railway Company.

STAINED GLASS AND DECORATION.

Window, St. John's Church, Redlands, Bristol.—A six-light memorial window, erected in the south aisle of St. John's Church, Redland, Bristol, was dedicated on Saturday last. The sub- ject in the upper tier extending over the whole three lights is "Christ blessing little children," while in the lower tier the subject of the centre light is "Our Lord as the Good Shepherd," and in the right and left hand lights respectively, "Are they not all ministering spirits," &c., and "Their angels do always behold the face of my Father which is in Heaven." The window was designed and executed by Mr. T. W. Camm, of Smethwick, near Birmingham. The whole was superintended on behalf of the committee by Mr. E. C. Hanson, of Bristol.

FOREIGN.

France.—The new Sorbonne is to be opened in July.——The new parochial Church of Sainte-Anne in the Rue de Tolbiac, Paris, from the designs of M. Bobin, has just been inaugurated. It was com- menced in 1892, to replace the Chapelle Bréa.——There is a question of restoring the Church of St. Severin, Paris, an operation which would include also the opening out of a fine cloister of the fifteenth century.——The Muni- cipal Council of Paris will shortly be occupied with a scheme for the rebuilding of the Mairie of the VIIIth Arrondissement, on a site in the Square Delaborde.——A competition has been opened for a new Savings Bank at Sens, and the design of M. Dupoigny, of that town, has been selected.——The monument to Daudet, by M. Falguière, was inaugu- rated last Sunday at Nimes.——The Exhibition of Pastellists opened on Monday at the Georges Petit Gallery; it includes contributions by MM. Bernard, Latouche, Lhermitte, Helleu, and other eminent artists.

India.—A large central goods station is to be erected at Cawnpore; expenditure to a considerable amount has already been sanctioned for the pur- chase of the site.——The North-Western Railway Company has taken over the lunatic asylum site at Lahore, and during the next few months will build large staff quarters thereon.——The Indian Govern- ment has adopted a scheme for the execution of im- portant water-supply works for Negapatam.——The question of obtaining water from artesian wells in the Central Provinces is again under considera- tion. It has now been decided to sink a well by way of experiment at Kalmeshwar, in the Nagpur district, as a result of a conference of geological experts.——The American diamond drill is coming into considerable use for prospecting in the Bengal coalfields.——A hospital to accommo- date fifty in-patients, and arrangements for outdoor patients, has been designed by Mr. G. Penn-Simkins, District Engineer of Saran, for the city of Hathwa. It is intended as a Jubilee memorial, and the cost is defrayed by the late Maharajah of Hathwa. The building is on one floor, and, on plan, resembles the letter H; the wards, &c., have, for the most part, been placed in two wings, and the administrative offices in the centre. The operating-room is imme- diately behind these offices, and separated, except for a covered way, from the wing on either side.

MISCELLANEOUS.

Professional and Business Announcements. —Mr. A. Hessell Tiltman, architect, is removing his office from 6, John-street, Bedford-row, to his own residence, 51, Russell-square, W.C.——Messrs. Fry & Co., 19, Farringdon-avenue, have been appointed London representatives for the firms of Messrs. Charles Joyner & Co. (Birmingham), W. & A. W. Hulse (Birmingham), B. Woodall & Co. (Dudley), and Butler Chisholm & Co. (Birmingham).

Choir and Clergy Stalls, Parish Church, Stratford-on-Avon.—New choir and clergy stalls have been erected at the east end of the nave of this church from designs by Mr. G. F. Bodley.

Sanitary Reform, Hull.—The monthly meeting of the Hull City Council was held on the 5th inst., the Mayor (Councillor W. A. Gelder) presiding. The principal item on the agenda was the report of the Nuisance Sub-committee and the recommenda- tion of the Sanitary Comittee that radical reforms be adopted with reference to the collection of night- soil and house refuse. A comprehensive report was tabled, from which it appears that there are 56,861 houses in Hull, and only 10,025 are supplied with water-closet accommodation, the remaining 49,430 being what are called privy houses, and of these 36,109 have no back ways, and are described as "a danger to public health." The Committee's recommendations are given under seven heads. They ask the Council to draw the attention of the medical officer and sanitary inspector to those 36,109 houses which have no back ways, and where the privy is within six feet of the door or window of the dwelling; and they recommend the insertion of a clause in any future Corporation bill whereby the Works Committee may have power to refuse to pass any building plan which does not provide for a water-closet. Other recommendations include the sub-division of night-soil districts, and the collection of house and combustible shop refuse by the em- ployees of the Corporation, instead of allowing it to remain in the hands of the contractors. Before calling upon Alderman Fraser to move the adoption of these recommendations, the Mayor suggested that the discussion should be deferred until the return of Alderman Massey (chairman of the Water Committee) from London, and until the Town Clerk had prepared a report on their powers and the legality of the course they were asked to pursue. After discussion, Alderman Fraser accepted a reso- lution to deal with the report at a special meeting of the Council, about the end of April.

Aberdeen Corporation Tramways. — The House of Commons Committee has passed Aberdeen Corporation Tramway Bill, with the exception of proposed tramway to Torry so far as it would pass along part of Market-street and the whole length of Upper Quay. The works authorised are extensions to Ferryhill and Sea-bathing Station, and the doubling of lines and electrical equipment, where not pre- viously executed. According to the Parliamentary Committee's decision the Torry tramway could only be a small isolated one, having no connexion with the general system for the city, but this difficulty will no doubt be overcome soon, when the local inquiry principle as to Scotch Private Bill legislation comes into force.

The "Hanging Bridge," Manchester.—The dis- covery of a portion of the old Hanging Bridge near the Manchester Cathedral was discussed at a meet- ing of the Lancashire and Cheshire Antiquarian Society held in the Chetham Hospital on the 6th inst., under the chairmanship of Mr. C. W. Sutton. Mr. J. J. Phelps submitted for inspection a number of photographs of the structure. He also read a memorandum in which he described the bridge, and expressed the opinion that its erection might safely be ascribed to the fifteenth century. Discussing the question of its future preservation, he stated that the Improvement Committee of the Corporation, on making an inspection, had discovered that a portion of the arches lay beneath and formed the support of the Hanging Bridge passage, from which the tenants on the east side had access to their premises. This created a difficulty, for if the bridge were to be removed the necessary excavations which would take place would interfere with these tenants' right of access. The matter, he understood, would remain in abeyance until the property had been pulled down on the west side, and then another inspection would be made. In the meantime the Corporation were having as complete a series of photographs taken as was possible. The probability was that the Corporation would not interfere with the bridge, but if the adjoining land were sold for building purposes, then, of course, the bridge would be built over and again lost to sight. Mr. Phelps urged that an attempt should be made to preserve the bridge, either by making it accessible where it stood or by removing it to some suitable spot.—Mr. Fletcher Moss (who is a member of the Improvements Committee of the City Council) said that the man who had purchased the materials of the old structure claimed that he had also bought the bridge. This was denied by the Town Clerk and the legal members of the Com- mittee, who were of opinion that the bridge was the property of the Corporation. The purchaser of the old material, therefore, had been served with legal notice forbidding him to interfere with the bridge, and he was now taking down the other buildings without touching the bridge. Mr. Moss was of opinion that the Corporation would preserve the bridge, either in its present position or in one of the parks. The Rev. E. F. Letts thought the bridge was probably erected at the time of the restoration of the Collegiate Church about the year 1400, in order that the stone required for building purposes might be carried across the Hanging Ditch. He said he did not doubt that the bridge stood upon Corporation land, and was therefore the property of the city. There would not be the slightest difficulty about removing it, there being sufficient space to build another bridge for the use of the neighbouring tenants. Consider- ing that this was one of the earliest bits of stone- work in Manchester, it would, he declared, be a disgrace to the city if the structure were not pre- served where it could be seen and appreciated. Mr. Moss added that in his opinion the name "Hanging Bridge" was not derived from the old drawbridge, but from the fact that in olden days there was a courthouse near the spot, within which, no doubt, malefactors were constantly hanged. After further discussion it was resolved, on the motion of Mr. Letts, to request the Corporation to do their utmost "to preserve such an interesting relic." Afterwards Mr. Henry Taylor read a paper on "The Ancient Crosses of Lancashire." This was the third of a series of seven papers which Mr. Taylor is contributing to the Society, and it dealt with the crosses and holy wells in the Hundred of Blackburn.

The National Gallery.—In his report for 1899 the Director states that the pictures purchased during that period were:—"Portrait of an Old Lady" and "A Burgomaster," both painted by Rembrandt van Rijn; "Virgin and Child," by Francesco di Giorgio; "Portrait of a Young Man," Dutch school, seventeenth century; and "View of St. Paul's from the Thames," British school, eighteenth century. The bequests and donations include Henry Wallis's "Death of Chatterton" (in a garret in Brooke-street, west side, Holborn); James Webb's "Saint Michael's Mount, Normandy; Andrew MacCallum's "Silvery Moments, Burnham Beeches;" "The All Pervad- ing," by G. F. Watts, R.A.; "Christ Disputing with the Doctors," by Francisco de Herrera the elder; and a "Study of Flowers," by Henri Fantin-Latour. The water-colours comprise a "View in Sussex," by A. V. Copley Fielding; "Cheyne Walk," by R. P. Bonington; "Castle Entrance," by George Cattermole; "Richmond Park," by William Ben- nett; A. B. Donaldson's "Puente San Martin, Toledo;" A. MacCallum's "Monarch of the Glen;" and John P. Gulich's "Violin Concerto." The collection has also acquired "Hounds in Leash" (plaster) by the late Harry Bates, A.R.A. In terms of the Chantrey Bequest the President and Council, R.A., have deposited in the Gallery of British Art, Millbank, W. R. Colton's bronze statue, "The Girdle;" J. Young Hunter's "My Lady's Garden;" T. Somerscales's "Off Valparaiso;" "Approaching Night," by H. W. B. Davis, R.A.; "The Battle of the Nile," by W. L. Wyllie, A.R.A.; and "Le Château d'O," a water-colour, by Charles Maun- drell. The registers of attendances show that 430,272 persons visited the National Gallery on the 206 free days of the year, besides 35,229 persons on the thirty-one Sunday afternoons, and 41,473 persons on the students' days, when a fee of 6d. is charged. For the British Art Gallery, Millbank, the corre- sponding totals are 177,420 (207 free days), 36,726 (thirty-one Sunday afternoons), and 24,307 (students' days). The admission fees, amounting to 1,644*l.* 10s. from both sources, are devoted as an "appropriation in aid" of the Parliamentary vote to the National Gallery.

Municipal Year Book, 1900.—We have received the new annual volume of this useful compilation, issued by Messrs. E. Lloyd, Limited (London), con- taining particulars of the constitution of all the municipal governments and Urban District Councils in England and Scotland, with notes in some cases of public works contemplated, together with sepa- rate statistics concerning gas and water supply, Local Government in Ireland, housing of the work- ing classes, &c.

American Fireproof Timber.—We have re- ceived a copy of the report of the "Underwriters' Bureau of Fire Protection Engineering," upon an experimental investigation of the properties of timber treated by the American Wood Fireproofing Company of New York. It is stated that the treat- ment adopted by this company differs from any other previously investigated, in that deliquescent

salts are not depended upon to produce the fire-resisting qualities, and the treatment is not confined to the surface of the wood. In this country salts which are not deliquescent, and methods which cause the fireproofing salts to penetrate to the heart of the timber, have long been used; but the statement that small slivers of the treated wood cut from samples which had been soaked in water at ordinary temperature for 100 hours, and then thoroughly dried, remained non-flammable in an alcohol flame is more interesting. Was the immersion in running water? On the other hand, it was found that samples of 1-in. sheathing which had been boiled for two hours in water showed a depreciation in fire-proof qualities, and in some cases would support combustion. The treated timber was also found to exert a corrosive action upon certain of the common metals, and although it is not flammable it gradually chars away when subjected to continued severe heat. The method of treatment appears to be very similar to that commonly adopted in England. The timber is placed in chambers provided with steam, pump, and drain connexions and equipped with a track for the lumber trucks. Steam at low pressure is first admitted and the timber is subjected to a moist steam bath for one to fifty hours, according to the size and variety of the wood. Then a vacuum pump is applied to draw the sap out of the wood, and "when the vacuum treatment is completed any possible acid reaction in the wood is eliminated by neutralisation" (with ammonia?). The fireproofing solution is then pumped into the chamber, and absorption is assisted by aid of a partial vacuum. A pressure of 80 to 200 lbs. per square inch is then applied and maintained until absorption is complete. After draining, the wood is either kiln or air dried, and the wood cells are left filled with minute crystals of fireproofing salts. Apparently the result of this treatment is almost identical with the results obtained by some of the methods adopted here. With all its defects, fireproofed timber is undoubtedly of great value in many situations, such as in temporary exhibition buildings where the danger from fire is great and the slow corrosion of nails and screws embedded in the wood is a matter of little importance. Candid and impartial reports such as that before us materially assist in increasing its utility, since they tend to prevent the employment of fireproofed timber in unsuitable positions, and give the builder fair indications as to its true value.

CAPITAL AND LABOUR.

LONDON JOINERS AND CARPENTERS.—It is reported that a movement is on foot among the joiners and carpenters of London to obtain an increase of wages, and an improvement of other conditions of labour. Since the last strike the union men have been receiving 10d. per hour for ordinary time, and additional pay for all overtime. They are now asking for an increase of a penny per hour, and this demand has been handed in to the employers within the twelve miles' radius of Charing-cross. The masters have, it is understood, made an offer to meet the men half-way with a rise of one halfpenny per hour.

ABERDEEN JOINERS AND CARTERS.—The position in the joiners' strike is unchanged. On 2nd inst. carters employed by carting contractors struck to the number of upwards of 600, their demand for a rise of wages having been refused. No settlement has been arrived at. The strike has caused inconvenience in the building and ornamental granite trades.

LOCK-OUT OF LIVERPOOL JOINERS.—On the 9th inst. 50 per cent. of the joiners employed in Liverpool were locked out, owing to differences between themselves and the employers. The matter in dispute has reference to the laying of wooden blocks for floorings, a work which for some time has been performed by a special class of workers, who are paid by piece for it. The Joiners' Union, it is stated, a few days ago came to a unanimous decision that the laying of wooden blocks came within the range of their work, and in future this work must be done by them. To further demonstrate their intention they withdrew from a building in Cook-street all the joiners employed on the job. This resulted in the employers deciding on a lock-out of 50 per cent. of the men. The masters contend that by employing joiners for laying wooden blocks it would mean considerable additional expense to them. On the other hand, the operatives contend that that is purely joiners' work, the joiner having to construct all kinds of floors, even parqueterie flooring.

LEGAL.

ACTION BETWEEN A BUILDER AND BUILDING OWNER.

THE case of Mayhoe *v.* Sharpless came before Mr. Justice Day and a special jury in the Queen's Bench Division on the 5th inst.

Upon the case being called on, Counsel for the defendant stated that the plaintiff was unrepresented, and he submitted he was entitled to a formal verdict on the claim. There was, however, a counterclaim by the defendant against the plaintiff. The plaintiff was a builder, and the defendant was the owner of some building land. It appeared that last year the defendant and the plaintiff entered into a building agreement, the defendant agreeing to advance certain sums of money as the work progressed. The agreement also stipulated that the work should be finished by a certain time, but this part of the agreement was not carried out. The builder did not finish the building, and, in fact, drew more money than he was entitled to under the agreement. The defendant proceeded to take possession of all the building materials that were on the premises. The plaintiff then commenced the action, claiming damages, alleging that the defendant had taken certain bricks and drain pipes, but so far as the claim was concerned the defendant would get a verdict. The defendant then counter-claimed for damages against the plaintiff, alleging that not only had the plaintiff not only not completed the buildings, but said that through the plaintiff's conduct he had sustained damage. There was a clause in the agreement that the plaintiff should not take more sand from the land than was required for the building purposes. But the plaintiff took out from the different blocks 215 yards of sand and sold it. The defendant said that the value of the sand was 43*l.* The plaintiff also took out of the cellars sand in such a way as to endanger the structures, and for that the defendant claimed 6*l.* 7*s.* 4*d.* The excavations under the cellars the plaintiff filled in with rubbish which the defendant had to take away and replace by concrete involving further expense. The total amount of the defendant's claim against the plaintiff was 98*l.* 8*s.* 9*d.*

After formal evidence had been given, the jury returned a verdict for defendant on the claim, and also on the counter-claim for 98*l.* 8*s.* 9*d.*, and judgment was entered accordingly with costs.

CARDIFF BUILDING DISPUTE.

THE case of Jacob *v.* Down came before Mr. Justice Stirling, in the Chancery Division, on the 5th inst., for judgment. The action was brought by the plaintiff to recover certain premises at Working-street, Cardiff. The defendant was in possession of the premises under a lease of June 4, 1894, granted by one Jacob Harris, who was tenant for life of the property under the will of Evan Harris. Upon the land claimed were four cottages, and the lease contained a provision that the defendant should within four calendar months from the date of it pull them down and erect upon the land shops, messuages, or dwelling-houses of a value of not less than 2,500*l.*, in accordance with plans to be approved of by the lessor, and a further covenant to keep the premises in good repair when erected.

The case was argued on January 27 last.

His lordship, in giving judgment, said the lessor retained the right of re-entry in case of any breach of the covenants of the lease, and there was no question that the lessee had failed to erect the buildings within the period stipulated, and in point of fact the buildings never had been erected. On June 20, 1895, a letter was written by the lessor complaining of a breach of non-erection, but notwithstanding that the rent which became due in August, 1895, was paid or accepted on behalf of Harris. Harris died at the end of 1895, and the plaintiffs became entitled in reversion, and rent was paid and received by them without prejudice to any question. On August 3, 1898, the plaintiff gave notice under Section 14 of the Conveyancing Act of 1881, setting out the building covenant and stating that it had been broken, and calling upon the defendant to remedy the breach, but the notice made no reference to the repairing covenant. The action was commenced on November 5, 1898. The statement of claim which was delivered on December 20 claimed delivery up of the premises for breach of the building covenant, but no mention was made of the repairing covenant. The defence was that the breach had been waived by the plaintiff accepting rent, and that the defendant had still an intention to rebuild the premises. In these circumstances it was a question of whether there had been a continuing breach of any of the covenants. In his Lordship's opinion the covenant to repair imposed an obligation to rebuild. In his opinion there had been no continuing breach of the building covenant, but there was a breach of the repairing covenant. The object of requiring notice to be given was to give the defendant an opportunity of repairing any breach before proceedings were commenced against him. No notice whatever had been given of a breach under the repairing covenant, and, as the plaintiffs were not entitled to rely upon the breach of the building covenant, the notice given was not sufficient to enable the defendants to rely upon the continuing breach of the repairing covenant, and the action must be dismissed.

CASE UNDER THE WORKMEN'S COMPENSATION ACT:

CLAIM BY A PAINTER AGAINST A RAILWAY COMPANY.

THE case of Pearce *v.* the London and South-Western Railway Company came before the Court of Appeal, composed of Lords Justices Collins, Vaughan Williams, and Romer, on the 6th inst., on the appeal of the workman from the refusal of Judge Addison, sitting at the Southwark County Court, to assess compensation under the Workmen's Compensation Act, 1897. The facts were these: The appellant was a painter in the employment of Messrs. Perry & Co., builders and contractors. Messrs. Perry & Co. entered into a contract with the London and South-Western Railway Company to do such work, such as altering, repairing, and painting the company's stations in the London district, as they might be directed to do by the District Engineer at a fixed schedule of prices. At the time of the accident Messrs. Perry & Co. were engaged under the contract in reconstructing Hamptom Court station, and the appellant was employed by them on the work. While so employed the appellant was injured by an engine belonging to the respondents. The appellant contended that the respondents, though not his employers, were liable under Section 4 of the Act to pay compensation. The County Court Judge held that the respondents were not liable to pay compensation because the operation of Section 4 was excluded by the clause at the end, the building of a station being "no part of or process in the trade or business carried on" by the railway company, but being "merely ancillary or incidental" thereto. He therefore made an award in favour of the respondents. The County Court Judge also found that the accident arose "in the course of" the appellant's employment, but did not arise "out of" his employment, and upon that ground also he decided in favour of the respondents.

Mr. J. D. Crawford, for the appellant, contended that Section 4 of the Act applied to this case, and that Section made the railway company liable to pay compensation for an accident to a workman employed by the contractor in the execution of the work, and they would have been liable to pay compensation had such work been executed by their own workmen. The re-construction of the station was part of the business of the railway company, and was not merely ancillary or incidental thereto. The business of a railway was to carry passengers and goods, and to provide reasonable accommodation for that purpose. A station was a reasonable accommodation to provide. He therefore contended the County Court Judge was wrong.

Lord Justice Collins, without calling upon Mr. Lawson Walton, Q.C., and Mr. Acland for the Railway Company, in giving judgment, said that in his opinion the County Court Judge was right. He would assume that the accident to the appellant arose out of and in the course of his employment. Inasmuch as the appellant was not employed by the Railway Company he could only make them liable under Section 4 of the Act. That Section was clearly an enabling Section. If the Section had stopped before the proviso, a liability would, in his opinion, have been imposed upon the Railway Company under the Section. The last clause in the Section contained the condition. The Section was not to apply to a contract with any person for the execution by or under such contractor of any work which was merely ancillary or incidental to, and was no part of, or process in, the trade or business carried on by the Railway Company. In his opinion it would be difficult to find a better illustration than the present, of work which was merely ancillary or incidental to the business of a Railway Company as distinguished from work which was part of the business or trade of certain "undertakers." The primary duty of a railway company was to carry passengers and goods. The erection of a station was no part of or process in the trade or business carried on by a railway company. There was no obligation upon a railway company, apart from any special obligation assumed by them under their acts, to place a station at any intermediate spot on their line. The construction of the station was not part of the main work of the company, but was merely ancillary or incidental to it. It was, therefore, "no part of or procees in the trade or business carried on by" the company. In his opinion the County Court Judge was, therefore, right.

The other Lords Justices concurred, and the appeal was accordingly dismissed with costs.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

25,730.—DOOR LOCKS: *P. Kossov, W. Wiskin and P. Sofronow.*—The lock is to be opened with a key, made of a flexible thin steel plate, which when inserted into a narrow slot in the casing engages with a cylinder on whose surface are many pins or projections that pass into corresponding holes in the plate-key; when the key's end has passed beyond the cylinder it releases a set of lever catches which otherwise retain the bolt as locked, when the key is moved further it rotates the cylinder and draws back the bolt by means of a toothed-wheel and rack, the wheel remaining at rest during the cylinder's first movement; an arm upon the cylinder's spindle moves within a recess in the wheel, and presses a curved pin against a spring until the catches are free for the withdrawal of the bolt; if a wrong key is employed it is turned aside by pins into a recess and fails to act. In another arrangement the bolt can be moved by means of a handle upon its side which when pressed liberates the catches, and the bolt when withdrawn is held with a spring catch upon the handle spindle.

25,746.—ELECTRICAL HEATERS FOR ROOMS, OVENS, &c.: *F. and L. F. Christie.*—The heater consists of an angular support made of either wire mesh, perforated metal, slate, or porcelain, the metal being covered with enamel, mica, asbestos, or some similar refractory insulator, whereon is coiled a resistant strip or wire. Screw clamps carried upon insulators support the heater, and electrically connect its ends, and it may easily be replaced. The heater is specified as being available as a radiator for warming rooms, &c. In the case of its use with an oven it is protected from drippings by means of a metal sheet bent to shape. Switches whereby place the heaters in circuit will serve to regulate the heat, electrical or optical temperature indicators being used; or it may be automatically controlled by expansion or resistance variation.

25,750.—ECONOMICAL CONSUMPTION OF GAS: *P. Bernikel.*—The inventor devises an auxiliary gas cock which, after a given time, will be closed automatically by clockwork mechanism; the auxiliary cock is joined with links to a pivotted lever's one end, the other end being held by a spring against a cam, which is driven by the train within the casing; after lighting the gas the main cock and the other cock are turned on, and then the clockwork is wound up; as the clockwork runs down the cam is turned until its notch engages with a pawl so as to close the auxiliary cock and thereupon put out the flame.

25,769.—SUSPENSION CABLES FOR BRIDGES: *Maschinenbau A.-G. Nürnberg.*—The cables are made of cables separately anchored and clamped with metal straps, bolts joining them to one another and to the forked tension rods; the saddles consist of four sections, curved lengthwise and grooved; to provide a good bearing between the sections and a certain degree of flexibility, the lower parts of the sections are radially slotted; distance pieces are placed between the cables in the straps, together with stop-pieces, secured with bolts, between the strap-prongs at the lower ends.

25,808.—MINER'S DIALS AND SIMILAR SURVEYING INSTRUMENTS: *T. A. O'Donahue and F. Halden.*—The novelty of the contrivance lies in dispensing with the common method, as outside the instrument, of reading vertical angles and in the substitution of a pointer which travels over a dial upon the compass dial; bevel wheels or sectors gear the pointer with one of the trunnions of the rocking-ring that carries the telescope or sights.

25,831.—MARKING DIVISION LINES IN WALL AND OTHER PAPERS: *T. G. Day.*—For perforating wall papers in order that several widths may be printed in one roll and be afterwards divided along the marked lines, the material is perforated by a reciprocating tool as it is fed between the bed and the guide-plate of the machine, a cam upon the spindle of the driving-pulley operates the tool (clamped by a holder) in one direction, whilst a spring operates it in another direction; in a variant shape a ratchet-wheel whose teeth engage with a pin upon the holder, is substituted for the cam, and a hand-crank may supplant the pulley as driven by power.

25,876 and 26,097.—CLEANING, DISINFECTING, AND REPAIRING DRAIN AND OTHER PIPES: *G. F. Restall.*—Upon a cord or rod are mounted pairs of rubber or flexible discs which have guide-rollers and are held asunder by springs; the discs press the cement or disinfectant out of the inner chamber between them into the cavities or leaking joints of the pipes, as the rubbers are drawn through them with cords; for cleaning purposes scrapers or brushes are fastened on to the rod between the inner discs, or on to the discs instead. (26,097) In this form of the contrivance a nut which is mounted upon a coarse screw, reciprocated by the rod effects the rotation of a brush, or the brush may be turned by gearing as the rod is pulled through the pipe: for painting or disinfecting purposes, paint or disinfectant can be supplied to the brush from outside through its hollow spindle.

25,931.—CONSTRUCTION OF BRIDGES: *C Horton.*—The object of the invention is to do away with the use of rivets and other weakening adjustments; the columns or piers are made of T-beams which are clamped together, whilst the trussed girders consist of struts and tie-rods which are joined to curved beams with bolts that pass through ribbed clamps; four T-beams having their flanges outside and their webs meeting in the centre constitute a column, a socket-plate bolted on to a pier of masonry, and having flanges or lugs, receives the lower ends of the four T-beams, in whose middle point are clamps bolted together and fashioned with lugs for taking transverse, horizontal, and diagonal tie-rods; the curved beam is I-shaped in cross-section, its ends rest upon the inclined surfaces of shoes mounted upon roller bearings, the roller axles being mounted in parallel pierced plates in order that they may not rub against one another, the struts also are I-shaped in cross-section, bolts are passed through eyes in the tension-rods (which are flat) and in the flanges of the struts, the webs of the struts have additional eye-plates, and the bolts are received in notches cut in the curved beam's flanges; from the lower tie-bolts are suspended braced transverse girders which carry the bridge's floor; further strength to resist wind pressure on the sides is provided by inclined T-iron bars which stretch between the ends of the braced transverse girders and the upper tie-bolts.

26,006.—A SASH FASTENER: *N. F. Butler & T. Minty.*—On the frame is a holder, which carries a screw bolt; to the sash is fastened a plate having a socket for the padded head of the screw bolt, a spring being arranged for the withdrawal of the bolt. In the case of heavy sashes a fastener is attached to each side; it may, however, be affixed to either sash and at the top or bottom, instead of the side of the window.

26,034.—GAS FITTINGS: *F. B. Colbran.*—Under this invention the customary cup-and-ball or other similar joint is altered into an anti-vibration fitting; a spiral spring is set around an india-rubber tube in such a manner that it will be compressed between the ball's inner face and a flange upon the down-tube. The ball has a tail-piece and a stuffing-box. By another arrangement the ball and stuffing-box are discarded, and a gas-tight joint is effected by means of the compression of an india-rubber tube between a flange of the cup and the flange of the down-tube, the latter's upward movement being limited by a flanged socket that is screwed on to it and abuts against the cup's lower end.

26,067.—HOLDERS FOR INCANDESCENT LAMPS: *H. C. Gover & C. F. Proctor.*—The cap of the lamp is secured to a porcelain or other insulating ring by means of bayonet notches on the latter which engage with pins on the former, the supply wires are attached with holding-bolts to terminal blocks set in a channel around the ring, within holes in the ring and the blocks are inserted the ends of two wire springs whose coils are laid in the channel, buttons that press upon the lamp's contact-plates are carried by loops formed of the middle portions of the wires, and a mica or similar disc is laid between the ring and another cap fastened on to it with two screws.

26,120.—SIPHONICAL DISCHARGE: *H. F. Standing & C. F. Dixon.*—For apparatus in which the flush starts through the escape of trapped and compressed air, the discharge pipe becomes trapped by causing it to dip into a short stand-pipe. When the water-level ascends within the tank it falls at the same time within the stand-pipe until it reaches the level of the discharge pipe's outlet, whereupon air escapes and a flush ensues.

26,143.—BUILDINGS OF CONCRETE: *P. T. L. Toelpe.*—For the construction of walls, piers for bridges, quay walls, submerged walls, &c., is devised a frame made up of hollow iron standards joined to one another with flat bars, and with angle-irons to the foundation; T-headed bolts, inserted within metal sockets in the planks, and through vertical slots in the standards, fasten the planks to the standards; the planks are locked firmly when the bolts are turned through 90 deg., and the bolt-heads are bevelled inside in order that they may press against the similarly bevelled surfaces of the standards; concrete is rammed between the planks, and when it is set a fresh layer is inserted beneath the lifted planks. For strengthening purposes the skeleton or framework is left imbedded in the wall, though by a modification of the mode of construction it may be taken away, in which method the standards are joined together with transverse screwed rods or bolts, being detached by removing the nuts from the ends of the rods. The invention is described as being adapted for constructing houses, farm buildings, warehouses, &c.

26,194.—MOULDING FLANGED, SOCKET-AND-SPIGOT, AND SIMILAR PIPES: *F. Herbert.*—A measuring rod, which projects from the cone-shaped end of the pattern ram, is placed in its lowest position within the moulding-box filled with sand, which is then pressed by a ram that drives the pattern ram upwards, whilst the ram's end, or a sleeve, forms the spigot end of the pipe; then the socket pattern is driven down by a hollow ram. In a varying plan the socket pattern is made upon the ram, and the spigot pattern is held in the top of the box, or a hollow ram at its lower end may carry the socket pattern.

MEETINGS.

FRIDAY, APRIL 13.

Glasgow and West of Scotland Architectural Craftsmen's Society.—Mr. T. S. Fraser on "Principles of Practical Design." 8 p.m.

WEDNESDAY, APRIL 18.

Builders' Foremen and Clerks of Works' Institution.—Quarterly meeting of the members. 8 p.m.

SATURDAY, APRIL 21.

Dundee Institute of Architecture.—Visit to Messrs. Justice & Son's works and Kingoodie House.

Edinburgh Architectural Association.—Visit to Dysart House and Ravenscraig Castle.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 30.—By BLACKFORD & SON (at Barnstaple).

Goodleigh, Devon.—"Eastacott Farm," 91 a. 0 r. 17 p., f. £1,350
Swimbridge, Devon.—Three freehold houses and "Harding's Field," 1¾ a. 178

By E. HOLSWORTH.

Dalston.—7, 9 and 11, Holly-st., u.t. 21½ yrs., g.r. 9*l.* 620
Ball's Pond.—47, King Henry's Walk, u.t. 50 yrs. g.r. 6*l.* 15*s.*, r. 60*l.* 415
City-road.—18, Remington-st., u.t. 24¾ yrs., g.r. 5*l.*, e.r. 40*l.* £285
Stoke Newington.—41 and 45, Chapel-rd., u.t. 80½ yrs., g.r. 12*l.*, r. 64*l.* 685

By NORRIS & HADLEY.

Stepney.—Dempsey-st., i.g.r. 21*l.*, u.t. 13 yrs., g.r. 12*l.* 125
Brixton.—34 and 36, Wynne-rd., u.t. 62 yrs., g.r. 9*l.* 10*s.*, r. 70*l.* 790
18, Loughborough Park, u.t. 23 yrs., g.r. 5*l.*, r. 36*l.* 260

By RIDER & SONS.

Kilburn.—10 to 20, Bridge-st., u.t. 58½ yrs., g.r. 55*l.* 2,000
65 and 93, Canterbury-rd., u.t. 57½ yrs, g.r. 10*l.* 515
Paddington.—39 and 43, Brindley-st., u.t. 45 yrs., g.r. 10*l.*, r. 60*l.* 540
St. John's Wood.—40, New-st., u.t. 28 yrs., g.r. 5*l.*, r. 38*l.* 355
Chalk Farm.—46, Belmont-st., u.t. 54 yrs., g.r. 6*l.* 10*s.*, r. 48*l.* 380
Notting Hill.—26 and 28, Uxbridge-st., u.t. 49 yrs., g.r. 10*l.* 530
108 and 110, Portland-rd., u.t. 52 yrs., g.r. 20*l.*, ... 420

By E. & S. SMITH.

Clerkenwell.—7, Penton-st., u.t. 46 yrs., g.r. nil., r. 52*l.* 500

By A. J. SHEFFIELD.

Victoria Docks.—35 to 41 (odd), Wightman-st., f. 1,180
Canning Town.—2, Portland-rd., u.t. 77½ yrs., g.r. 4*l.* 205
96, 98, and 100, Scott-st., u.t. 66 yrs., g.r. 9*l.* 9*s.* 220
Hackney.—143 and 147, Hackney-rd., u.t. 67 yrs., g.r. 40*l.*, r. 115*l.* 1,215

By T. B. WESTACOTT.

Gray's Inn-rd.—12, 13, 14, and 18, Regent-sq., u.t. 51½ yrs., g.r. 16*l.* 175
St. Pancras.—40, Judd-st., u.t. 9½ yrs., g.r. 26*l.* 5*s.* 160
16, Burton-cres., u.t. 6½ yrs., g.r. 3*l.* 10*s.* 115

March 31.—By SEWELL & BARNES (at Norwich).

Hethersett, Norfolk.—A freehold residence, and 4 a. 0 r. 13 p. 890
A freehold house, and oa. 2 r. 4 p. 420

April 2.—By GOODMAN & CROWTHER.

Walthamstow.—Wyatt's-lane, f.g.r.'s 16*l.*, reversion in 98½ yrs. 360

By F. MILLER & REID.

Pimlico.—64, Warwick-st., u.t. 34 yrs., g.r. 8*l.* 10*s.*, e.r. 60*l.* 635

By OGDEN, SONS & OLLEY.

Wimbledon.—34, Spencer-hill, u.t. 65 yrs., g.r. 12*l.* 12*s.*, r. 60*l.* 530
17, Ridgway-place, u.t. 51½ yrs., g.r. 9*l.*, e.r. 75*l.* 700

By J. CARTER JONAS & SONS.

Cambridge.—Hill's-rd., a freehold building estate, 5 a. 0 r. 20 p. 3,000

April 3.—By C. W. DAVIES & SON.

Islington.—55, Chapel-st., u.t. 14 yrs., g.r. 24*l.*, r. 60*l.* 250
7, Orchard-st., u.t. 16 yrs., g.r. 38*l.* e.r. 60*l.* 110
22, Dagmar-ter., u.t. 46 yrs., g.r. 5*l.* 12*s.*, r. 45*l.* 365
1, Swanley-st., u.t. 50 yrs., g.r. 4*l.*, r. 36*l.* 300

By W. B. HALLETT.

Holloway.—335, Camden-rd., u.t. 32 yrs.. g.r. 10*l.* 730

By KNIGHT, FRANK, & RUTLEY.

Manor Pk.—766, Romford-rd., f., r. 65*l.* 1,000

By ERNEST OWERS.

Hampstead.—15, Fairfax-rd., u.t. 54¾ yrs., g.r. 18*l.*, e.r. 130*l.* 1,600
Ealing.—39, Webster-gardens, u.t. 90 yrs., g.r. 8*l.*, e.r. 52*l.* 10*s.* 450

By HEPPER & SONS (at Leeds).

Leeds.—52, Basinghall-st, and 8, 9, and 10, Butts-court, area 1,022 yards, f. 8,750

By HUMBERT & FLINT (at Watford).

Wealdstone, Middlesex.—College-rd., two freehold cottages 500
Watford.—Bedford-st., Bedford Cottage, f., r. 24*l.* 440
Bushey-grove-road, three plots of land, f. 178
7 and 8, Cashio Hamlet, f. 170

April 4.—By CHESTERTON & SONS.

Kensington.—23, Young-st., f. 5,500
Camberwell.—41, 43, and 44, Kemerton-rd., f., r. 178*l.* 2*s.* 1,395

By FOSTER & CRANFIELD.

Plaistow.—19 to 45 (odd), Stanley-st., u.t. 75¼ yrs., g.r. 49*l.* 2,030
47 to 65 (odd), Stanley-st., u.t. 79¼ yrs., g.r. 35*l.* 1,375

By MARLER & MARLER.

Belgravia.—Cross-st., f.g.r. 203*l.* 6*s.* 6*d.*, reversion in 93 yrs. 5,000

By S. PUGH READ & CO.

Caledonian-rd.—21, Gifford-st., u.t. 44 yrs., g.r. 7*l.* 10*s.*, r. 30*l.* 230
Kilburn.—31, Kenilworth-rd., f., r. 33*l.* 525

By REYNOLDS & EASON.

Norwood.—35, 37, and 39, Clive-rd., u.t. 216 yrs., g.r. 9*l.* 12*s.* 735
84, 86, and 88, Woodland-rd., u.t. 59 yrs., g.r. 18*l.* 3*s.*, r. 75*l.* 555
Hornsey.—47, Lightfoot-rd., u.t. 80 yrs., g.r. 7*l.* 7*s.* 230

By RODD & MARTIN.

Battersea.—Freeland-st., f.g. rents 38*l.*, reversion in 66½ yrs. 1,100

By ORGILL, MARKS, & LAWRENCE (at Horse Shoe Hotel).

Fulham.—66 and 68, Greyhound-rd., also "The Castle" beerhouse adjoining, u.t. 67½ yrs., g.r. 9*l.*, r. 136*l.* 8*s.* 3,650

By N. EASTON & SON (at Hull).

Willerby, Yorks.—Rawdales Farm, 73 acres 3,500

April 5.—By AVANT & CROYDEN.

Wandsworth.—1, 3, and 5, Dawlish-st., u.t. 45 yrs., g.r. 15*l.* 030
43, Dawlish-st., u.t. 31½ yrs., g.r. 3*l.* 11*s.* 9*d.* .. 170
31, Wyvil-rd., u.t. 46 yrs., g.r. 5*l.* 275
Tooting Graveney.—97 to 105 (odd), Trevelyan-rd., u.t. 76½ yrs., g.r. 20*l.* 1,030
Chiswick.—33, Elliott-rd., u.t. 76 yrs., g.r. 5*l.* 5*s.*, e.r. 32*l.* 350

By COOK, SMITH, & WAGHORN.

Hackney.—25 and 26, Queen's Down-rd., f., r. 90*l.* 1,455
Uxbridge, Middlesex.—Beckett-ter., f.g.r. 20*l.* reversion in 80 yrs. 575

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*School	Berkhampstead, &c., School Assoc.	50*l.* ; 35*l.* ; and 15*l.*	June 16

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Four Purifiers	Hindley (Lancs.) U.D.C.	S. Holt, Council Offices, Hindley	April 17
Cast-Iron Pipes (6 miles)	Huddersfield Corporation	T. & C. Hawksley, Engineers, 30, Great George-street, S.W.	do.
Stables and Warehouse	Aberaychan Co-op. Society, Ltd.	J. Maggs, Aberaychan	do.
Grit Setts (700 tons), near Wigan	Ince U.D.C.	A. T. Sevain, Surveyor, Council Offices	do.
Sewerage Works, &c., Maindee, near Newport	.....	A. T. Roberts & Co., 23, St. Mary-street, Cardiff	do.
Private Street Works	Bury (Lancs.) Corporation	A. W. Bradley, Civil Engineer, Corporation Offices	do.
Cast-Iron Pipes, &c.	Hindley (Lancs.) U.D.C.	S. Holt, Council Offices, Hindley	do.
Sewerage Works, near Shrewsbury	.....	County Surveyor, Shire Hall, Shrewsbury	April 18
Hall, Elion, Aberdeen	.....	Jenkins & Mars, Civil Engineers, 16, Bridge-street, Aberdeen	do.
Telephone Cables	Glasgow Corporation	A. R. Bennett, Engineer, City Chambers, Glasgow	do.
Road Improvements, Broad-street	Aberaychan U.D.C.	E. Cooke, Council Offices, Aberaychan	do.
Filter Tank, &c.	North Berwick Burgh Commrs.	J. & A. Leslie & Reid, C.E., 72A, George-street, Edinburgh	April 19
*Drain Pipes	Bethnal Green Vestry	Surveyor, Vestry Hall, Church-row, Bethnal Green	do.
*Cleaning and Painting	Midland Railway	See Advertisement	do.
Breakwater, &c., Portknockie, N.B.	.....	D. & C. Stevenson, Civil Engineers, 84, George-street, Edinburgh	April 20
Alterations to Offices, &c.	Boston Docks, &c., Commissioners	Engineer, Market Place, Boston	do.
Sewerage Works, Huddersfield	.....	Abbey & Hanson, Civil Engineers, Huddersfield	April 21
Overflow Pipes, &c.	Burnley Corporation	A. Steel, Sheldon Town Hall	do.
Gasholders, &c.	New Mills Town Council	E. Jones, Engineer, Town Hall, New Mills	do.
Sewerage Works	Gildersome U.D.C.	J. Waugh, Civil Engineer, Sunbridge Chambers, Bradford	do.
Pavement Works	Warminster U.D.C.	A. F. Long, Surveyor, Council Offices	do.
*School	Norwood (Middlesex) School Bd.	G. E. T. Lawrence, 22, Buckingham-street, Adelphi, W.C.	do.
Gasholder, &c.	Ilford Gas Company	J. H. Brown, Engineer, Gas Works, Ilford	April 23
Well Sinking	Finedon (Northants.) U.D.C.	Mosley & Scrivener, Engineers, Fish-street, Northampton	do.
Well Sinking, &c., near Snaith, Yorks.	Goole U.D.C.	J. C. Mellis, C.E., 264, Gresham House, Old Broad-street, E.C.	do.
*Coal Store and Workshops at Workhouse	Kingston Guardians	W. H. Hope, Architect, Union Offices, Kingston-on-Thames	April 24
Draining, Kerbing, &c., Horsecroft-road	Hemel Hempstead Corporation	W. B. Locke, Surveyor, Town Hall	April 25
*Conveniences	Islington Vestry	Chief Surveyor, Vestry Hall, Upper-street, Islington, N.	do.
*Cottage Homes	Woolwich Guardians	Church, Quick & Whincop, Architects, William-street, Woolwich	do.
*Public Baths	Winchester Corporation	See Advertisement	April 27
*Church, Lancaster-road, Notting Hill	.....	C. J. Mann & Son, 29, Great George-street, S.W.	April 28
Bridge, Dedham Mill	Essex and East Suffolk C.C.	Widnell & Trollope, Broad Sanctuary Chamb'rs, W'stminster, S.W.	do.
*New Infant Schools	Herne School Board	Egerton Collard, Architect, 12, East-street, Herne Bay	April 30
*New School	Blackpool School Board	Anderson, Simon & Crawford, Archts., 16, Rutland-sq., Edinburgh	do.
*Sewerage Works	Ludlow Corporation	Pollard & Tingle, Engrs., 31, Old Queen-st., Westminster, S.W.	May 2
*Brickwork Chimney Shaft	Bermondsey Vestry	Town Hall, Spa-road, Bermondsey	May 4
*Removal of Refuse, &c.	Corporation of London	Town Clerk, Public Health Department, Guildhall	May 8
Warehouse and Stabling, Wyke, Bradford	.....	Brayshaw & Dixon, Architects, Bradford	No date
Offices, Bruntcliffe, Yorks.	.....	Buttery & Birds, Architects, Queen-street, Morley	do.
Additions to Schools, Carlisle	.....	Oliver & Dodgshun, Architects, Carlisle	do.
Pier, Berehaven, co. Cork	.....	R. & C. Sanders, 1, Dawson-street, Dublin	do.
School, Etherley, Bishop Auckland	.....	H. Stobart & Co., Colliery Office, Etherley	do.
Schools	Perth School Board	A. G. Heiton, Architect, School Board Offices, Perth	do.
Gas Plant, Machinery, &c.	Hull Corporation	F. J. Bancroft, Engineer, Town Hall, Hull	do.
Roadstone, Kerbing, &c.	Goole U.D.C.	F. Chambers, Surveyor, Council Offices	do.
Additions to Club Premises	Walthamstow Liberal Club	F. Williams, Buxton-road, Walthamstow	do.
Drainage Works, Marshall-street, Leeds	.....	C. T. Wheatley, Crossgates, Leeds	do.
Drainage Works, Brechin, N.B.	.....	Mr. Spence, 8, Swan-street, Brechin, N.B.	do.
Stables, King's Arms Hotel, Dewsbury	Messrs. Bentley, Ltd.	F. W. Ridgway, Architect, Bond-street, Dewsbury	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
Quantity Surveyor's Assistant	London County Council	2*l.* 2*s.* per week	No date

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xx. Public Appointments, pp. xviii. & xx.

By FRANCIS & CO.

Camberwell.—50, Camberwell-grove, f., e.r. 45*l.*... £580

By G. HEAD & CO.

Marylebone.—31, Thayer-st., f. ... 2,300

Kingston Hill, Surrey.—8, 10, 12, and 14, Alexandra-rd., u.t. 66 yrs., g.r. 24*l.*, r. 133*l.*... 975

Camberwell.—15, Rust-sq., u.t. 58 yrs., g.r 6*l.* 6*s.* 250

By TRAFFORD & CARTER.

Old Ford.—32 and 24, Roman-rd., u.t. 44½ yrs., g.r. 50*l.*, e.r. 350*l.* ... 1,540

Mile End.—5, Trafalgar-sq., f. ... 660

Stoke Newington.—78 to 86 (even), St. Matthias-rd., u.t. 76 yrs., g.r. 25*l.*, r. 195*l.* ... 1,380

By NEWBON, EDWARDS, & SHEPHARD.

Notting Hill.—35, 37, and 39, Blenheim-cres., f., r. 139*l.* ... 2,195

99, 101, and 103, Blenheim-cres., u.t. 59¼ yrs., g.r. 25*l.* 48. ... 1,245

Dalston.—150, Queen's-rd., u.t. 29 yrs., g.r. 8*l.*, r. 36*l.* ... 285

Islington.—270, Essex-rd., u.t. 18 yrs., g.r. 10*l.*, r. 42*l.* ... 200

Canonbury.—98, St. Paul's-rd., u.t. 26 yrs., g.r. 13*l.*, r. 40*l.* ... 210

By C. C. & T. MOORE.

Shoreditch.—96, Curtain-rd., f., r. 749*l.* 18s. ... 4,550

77, 79, and 81, Curtain-rd., u.t. 52 yrs., g.r. 130*l.* ... 2,000

Bethnal Green.—7 to 15 (odd), Church-row, part f. and part u.t. 18¼ yrs., g.r. 10*l.* ... 1,600

Limehouse.—8, Beccles-st., f. ... 460

38 to 44 (even), Three Colt-st., f., r. 137*l.* ... 2,265

Limehouse.—47A, 49, 51, 53, and 55, Church-row, f. £1,150

By STIMSON & SONS.

Highgate. — Bramshill-gardens, f.g.r. 39*l.* 10s., reversion in 84 yrs. ... 1,020

Kilburn.—124, Abbey-rd., u.t. 45¾ yrs., g.r. 10*l.*, r. 55*l.* ... 500

Hampstead. — 197 and 201, Belsize-rd., u.t. 49¾ yrs., g.r. 1*l.*, r. 110*l.* ... 1,270

Ball's Pond.—9, King's Henry's-walk, f., r. 80*l.*... 1,550

Walthamstow. — Boundary-rd., &c., f.g.r's. 26*l.* 12s., reversion in 97½ yrs. ... 640

Brixton. — 54, Lambert-rd., u.t. 73¼ yrs., g.r. 6*l.* 15s., r. 45*l.* ... 450

Vauxhall.—123 and 125, Vauxhall-st., and 4 and 5, Dunmow-pl., f. ... 980

Camberwell.—25, Wilson-rd., u.t. 64 yrs., g.r. 7*l.*, r. 36*l.* ... 460

Peckham.—35, Elm-grove, u.t. 79½ yrs., g.r. 7*l.* 17s., r. 32*l.* ... 315

2 and 3, Sternhall-lane, u.t. 77¼ yrs., g.r. 10*l.* ... 425

Bermondsey.—86, 88, and 90, Camilla-rd., u.t. 38 yrs., g.r. 15*l.* ... 770

Deptford.—112, Evelyn-st., u.t. 62¼ yrs., g.r. 8*l.*, r. 45*l.* ... 500

By VICTOR VAUGHAN.

Camden Town.—Arlington-rd., f.g.r. 4*l.*, reversion in 37 yrs. ... 200

Barnsbury.—2, Sheen-grove, u.t. 36¼ yrs., g.r. 6*l.* 315

By WHETHERLY & HASLETT.

Finsbury Park. — Blackstock-rd., the "Sluice House" tavern, f.g.r. 150*l.*, reversion in 39 yrs. 7,500

Hoxton.—Hoxton-st., the "King's Arms" p.-h., f.g.r. 150*l.*, reversion in 65 yrs. ... £5,[illegible]

Holloway.—1, Campdale-rd., u.t. 67 yrs., g.r. 12*l.* 12s., r. 100*l.* ... 1,[illegible]

By HOOKER & WEBB (at Croydon).

Croydon.—Courtney-rd., six plots of land, f. ... 7[illegible]

22 and 24, Limes-rd., f., r. 68*l.* ... 9[illegible]

Caterham, Surrey.—1, 2 and 3, Rose Cottages, f. Rye-ter., four freehold cottages ... 7[illegible]

April 6.—By F. J. BISLEY & SONS.

New Cross.—56 and 58, Billington-st., u.t. 57 yrs., g.r. 10*l.*, r. 56*l.* ... [illegible]

Bermondsey.—16 and 17, Enid-st., u.t. 15 yrs., g.r. 6*l.* ... 2[illegible]

Rotherhithe.—287, Rotherhithe New-rd., u.t. 32 yrs., g.r. 5*l.* ... [illegible]

By MAY & ROWDEN.

Marylebone.—46, Weymouth-st., u.t. 49 yrs., g.r. 20*l.*, r. 150*l.* ... 1,5[illegible]

By G. A. WILKINSON & SON.

Oxford-st.—No. 462, u.t. 29 yrs., g.r. 6*l.* 6s., r. 200*l.* ... 5,[illegible]

St. John's Wood.—Abbey-rd., &c., f.g.r. 30*l.*, u.t. 17½ yrs., g.r. nil. ... [illegible]

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard

PRICES CURRENT OF MATERIALS:

WOOD.*

Per Petersburg standard hundred.

	£ s. d.	£ s. d.
White Sea: first yellow deals	18 0 0	23 0 0
Second do.	16 10 0	18 0 0
Third do.	13 10 0	14 10 0
battens, 4os., 3os., and 25s. less respectively.		
Petersburg: first yellow deals	15 15 0	18 0 0
Second do.	13 0 0	14 0 0
battens, 30s. and 20s. less respectively.		
Petersburg, white deals	12 10 0	15 0 0
Do. white battens	10 0 0	11 10 0
Riga, white deals	10 10 0	11 10 0
Swedish mixed yellow deals	16 0 0	21 0 0
" Third do.	14 0 0	17 0 0
" Fourth do.	13 0 0	14 0 0
" Fifth do.	12 0 0	13 0 0
battens, 30s., 20s., and 10s. less respectively.		
Whitewood, 10 to 20 per cent. less.		
Finnish assorted yellow deals	11 10 0	12 0 0
battens, 10s. and 5s. less respectively.		
Whitewood, 5 to 10 per cent. less.		
Norwegian second yellow battens	8 0 0	8 5 0
Third do.	7 10 0	8 0 0
Fourth do.	7 5 0	7 10 0
Whitewood, 10s. less.		
Danzig, Crown Deck deals, per 40 ft. 3 in.	0 15 0	1 5 0
Brack	0 18 0	1 0 0
St. Lawrence Pine deals, &c., per P.S.H.:—		
1st, Bright and Dry, regular sizes	21 0 0	28 0 0
" " oddments	14 10 0	22 0 0
2nd " regular sizes	16 10 0	19 0 0
" " oddments	11 0 0	15 10 0
3rd " regular sizes	10 10 0	11 10 0
" " oddments	9 0 0	10 0 0
4th " regular sizes	9 10 0	10 10 0
" " oddments	8 10 0	9 12 0
St. Lawrence Spruce deals, &c.		
First, regular sizes	11 0 0	13 10 0
Second "	10 0 0	10 10 0
Third "	9 15 0	10 0 0
Fourth "	9 5 0	9 15 0
Oddments and battens at 20s., 10s., 7s. 6d., and 5s. less respectively.		
New Brunswick Spruce deals, &c.	9 15 0	11 0 0
Oddments, battens, and fourths	9 5 0	9 15 0
United States pitch pine planks and boards	11 13 0	16 0 0
Prepared Boards, per square		
1¼ by 6½ and 7 in. 1st yellow	11 0	16 0
" " 2nd "	10 6	13 0
1 by 6½ and 7 in. 1st "	10 0	12 0
" " white	9 0	10 0
" " 2nd yellow	9 0	11 0
" " white	8 0	9 0
¾ by 6½ & 7 in. 1st & 2nd yellow	7 9	9 0
" " white	7 6	8 6
¾ by 6½ and 7 in. 1st yellow and white (grooved, tongued, and beaded)	8 6	9 6
¾ by 6½ and 7 in. 2nd yellow and white (ditto)	7 6	8 6
¾ by 6½ and 7 in. 1st yellow and white (ditto)	6 6	7 6
¾ by 6½ and 7 in. 2nd yellow and white (ditto)	6 0	7 0
Narrower widths at 10 per cent. less.		
Second quality at 15 per cent. less than 1st.		
Danzig and Memel Fir Timber—	per load	
Best middling	3 15 0	4 0 0
Good middling and Second	3 5 0	3 10 0
Common middling	3 0 0	3 5 0
Undersized	3 0 0	3 5 0
Swedish and Norwegian Balks	2 10 0	2 15 0
Baltic Oak Timber—		
Dantzig and Stettin—Large	4 0 0	5 10 0
Small	3 5 0	4 0 0
Quebec Timber	per load	
Yellow Pine	5 0 0	6 10 0
Oak	4 10 0	6 10 0
Elm	4 0 0	4 5 0
Ash	3 5 0	4 0 0
Birch	3 15 0	6 0 0
New Brunswick, &c., Birch	3 10 0	4 5 0
American Pitch Pine Timber	3 17 6	4 17 6
Lathwood, per log, 18 cubic ft.—		
Crown (Eng. & Dutch) / Brack / nominal	3 15 0 / 3 0 0	4 17 6 / 4 0 0
Firewood, per cubic fathom—		
Petersburg	4 0 0	6 10 0
Riga and Danzig	4 10 0	5 10 0
Archway Poles, per ft. run	0 0 1	0 0 1½
Oak Staves, per mille fall size pipe		
Memel, Crown	220 0 0	230 0 0
Brack	190 0 0	200 0 0
Dantzig	165 0 0	175 0 0
Prussian, single Barrel (nominal)	28 0 0	30 0 0
United States, Pipe	37 10 0	45 0 0
Hogshead, extra heavy and double extra	32 0 0	35 0 0
Indian Teaks per load	11 10 0	16 10 0
British Guiana Greenheart	0 0 0	8 0 0
Mahogany, per foot superficial—		
Honduras, cargo average	0 0 4½	0 0 5½
Nicaragua, do.	0 0 4½	0 0 5½
Tabasco, do.	0 0 4½	0 0 6
Mexican, do.	0 0 4	0 0 4½
Panama, do.	0 0 3½	0 0 4
African, do.	0 0 3½	0 0 5
Cuba, do.	0 0 6	0 0 8
St. Domingo, do.	0 0 5	0 0 7½
Do. Carls (good to prime)	0 0 9	0 1 3
Teak, American (logs)	0 3 0	0 5 0
Do. do. (planks and boards)	0 8 0	0 7 6
Indian, per foot superficial	0 0 3	0 0 7½
Black Sea, per ton	6 0 0	12 0 0
American Walnut (logs) per foot cube	0 1 0	0 1 6
" (planks and boards)	0 1 9	0 3 0

* The prices named are for the wood as imported and landed in the docks. Ten per cent., approximately, should be added in order to arrive at the current trade prices.

PRICES CURRENT (*Continued*).

	£ s. d.	£ s. d.
Sequoia (Californian redwood), per foot cube	0 1 9	0 2 0
Whitewood, American (logs)	0 1 4	0 1 9
" " (planks and boards)	0 1 9	0 2 9
Quartered oak " "	0 2 3	0 4 0
Kauri pine (logs)	0 1 9	0 2 0
" " (planks)	0 2 3	0 2 9
Jarrah (planks)	0 2 0	0 2 3
Lancewood spars each, fresh and large	0 5 0	0 7 0
Lancewood spars, ordinary to fair	0 3 0	0 4 0
Degame spars	0 8 0	0 10 0

METALS.

		£ s. d.	£ s. d.
IRON—Pig, in Scotland	ton	3 17 4	0 0 0
Bar, Welsh, in London		9 0 0	9 15 0
Do. do. at works in Wales		8 10 0	9 0 0
Do. Staffordshire, in London		9 15 0	11 15 0
COPPER—British cake and ingot		82 0 0	83 0 0
Best selected		83 0 0	83 12 0
Sheets, strong		87 0 0	88 0 0
Chili bars		79 0 0	0 0 0
YELLOW METAL	lb.	6½d.	7d.
LEAD—Pig			
Spanish	ton	16 15 0	0 0 0
English Com. Brands		17 0 0	0 0 0
Sheet, English, 6 lbs. per sq. ft. and upwards		18 10 0	0 0 0
Pipe		19 0 0	0 0 0
ZINC—English sheet	ton	26 10 0	0 0 0
Vieille Montagne		28 10 0	0 0 0
Spelter		22 0 0	22 5 0
TIN—Straits		135 0 0	135 5 0
Australian		135 5 0	135 15 0
English Ingots		139 0 0	140 0 0
Banca		0 0 0	0 0 0
Billiton		0 0 0	0 0 0

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
" " fourths	2d. " "
21 oz. thirds	3d. " "
" " fourths	2½d. " "
26 oz. thirds	4d. " "
" " fourths	3½d. " "
32 oz. thirds	5d. " "
" " fourths	4½d. " "
Fluted sheet, 15 oz.	2½d. " "
" " 21 "	3½d. " "

OILS, &c.

		£ s. d.	£ s. d.
Raw Linseed Oil in pipes, per ton		26 10 0	0 0 0
" " " in drums, per gal.		0 2 4	0 0 0
Boiled " " in pipes, per ton		28 10 0	0 0 0
" " " in drums, per gal.		0 2 6	0 0 0
TAR—Stockholm	barrel	1 6 6	0 0 0
Archangel		1 0 0	0 0 0
Turpentine, in barrels, per cwt.		2 2 0	0 0 0
" in drums, per gal.		0 3 4	0 0 0
Genuine Ground English White Lead		25 10 0	0 0 0
Red Lead		22 0 0	0 0 0
Best Linseed Oil Putty, per cwt.		0 8 0	0 0 0

BRICKS, &c.

	s. d.	
Hard Stocks	30 0	per thousand alongside, in river.
Rough Stocks and Grizzles	28 0 " "	" "
Smooth Bright Facing Stocks	38 0 " "	" "
Shippers	42 0 " "	" "
Flettons	29 0 " "	" "
Red Wire Cuts	34 0 " "	at railway depôt.
Best Fareham Red	72 6 " "	" "
Best Blue Pressed Staffordshire	85 0 " "	" "
Best Stourbridge Fire Bricks	84 0 " "	" "
Best White Glazed Stretchers	260 0 " "	" "
Headers	240 0 " "	" "
Quoins and Bull-nose	340 0 " "	" "
Double Headers	320 0 " "	" "
Best Dipped Salt Glazed Stretchers and Headers	240 0 " "	" "
Quoins and Bull-nose	280 0 " "	" "
Double Headers	280 0	per thousand at railway depôt.
Seconds Quality White and Dipped Salt Glazed	40 0	per thousand ess than best.
Thames and Pit Sand	7 0	per yard, delivered
Thames Ballast	6 6 "	"
Best Portland Cement	34 0	per ton "
Best Ground Blue Lias Lime	23 0 "	"

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s. od. per yard, delivered.
Stourbridge Fire-clay in sacks, 31s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt.
Bath "	1 7 "	"
Beer "	1 6½ "	"
Grinshill "	1 10 "	"
Brown Portland in blocks	2 2 "	"
Darley Dale "	2 1½ "	"
Red Corsehill "	2 5 "	"
Red Mansfield "	2 4½ "	"
Hard York "	2 10 "	"
Hard York 6 in. sawn both sides landings, 10 sizes (under 40 ft. sup.)	2 7	per ft. super. at rly. depôt.
" 6 in. Rubbed Ditto	2 10½ "	"
" 3 in. sawn both sides slabs (random sizes)	1 3 "	"
" " 3 in. self-faced Ditto	0 9 "	"

PRICES CURRENT (*Continued*).

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor	11 5 0	per 1000 of 1200 at ry. dep.
" best seconds "	10 15 0	" "
16× 8 best "	6 2 6	" "
20×10 best blue Portmadoc	20 18 0	" "
16× 8 " "	6 0 0	" "
20×10 best Eureka unfading green	11 2 6	" "
16× 8 " "	6 15 0	" "
20×10 Permanent green and Sedan green	10 0 0	" "
16× 8 " "	5 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	40 6	per 1,000 at rly. depôt.
Hip and valley tiles	3 6	per doz. " "
Best Broseley tiles	47 6	per 1,000 " "
Hip and valley tiles	4 0	per doz. " "

TO CORRESPONDENTS.

T. O. V. (Below our limit). A. W. B. (Amounts should have been stated). P. & Co. (Too late; next week).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

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Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BASINGSTOKE.—For work at Basingstoke Union Workhouse.

Laundry Fittings.

Benham & Sons	£257 0	‡ Kingdon & Co., Basingstoke	£210 10
Barford & Perkins	221 14	Russell & Co.	197 19
Armstrong & Co.	218 0	Bradford & Co.	197 10
Summerscales & Sons	211 19	Manchester Laundry Co.	144 10

Engine and Pumps.

Benhan & Sons	£256 13 0	Blackwell & Co.	£175 10 0
‡ Crossley Bros.	206 18 6	Owens & Co.	145 0 0
Heyward Tyler & Co.	201 10 0	Russell & Co.	94 18 6

‡ Recommended for acceptance.

CARLTON.—For erecting new Baptist chapel and school, &c., Carlton, near Nottingham. Mr. Richard Whitbread, architect, Vine House, Carlton, Nottingham:—

	Chapel.	School.
Bell	£1,789 10	£1,350 0
Cuthbert	1,687 15	1,329 0
Green	1,859 0	1,380 0
Tegardine, Carlton*	1,603 0	1,263 0
Harper	1,595 0	1,223 0
Main	1,623 0	1,295 0

DARTFORD.—For the erection of eight houses and one shop in St. Alban's-road for Mr. Mark Jacobs. Mr Thos. Wooller, architect, Dartford:—

Enness Bros.* £2,650

DEVONPORT.—For alterations and additions to the Royal British Female Orphan Asylum, Stoke, Devonport, for the Managing Committee. Mr. Henry George Luff, architect, 64, Chapel-street, Devonport:—

T. May	£328 0 0	F. C. Ambrose	£245 0 0
Smith & Son	278 15 0	W. J. Oliver*	240 14 10

ERITH (Kent).—For the erection of a pair of houses and shops for the trustees of the Cottage Hospital. Mr. W. Egerton, architect, Erith. Quantities by the architect:—

Finnecy & Son	£1,838 13 2	Spencer & Son	£1,698 10 0
Geo. Miles	1,813 0 0	Enness Bros*	1,668 0 0

[*See also next page*

LONDON.—For new roads for the Hornsey District Council. Mr. E. J. Lovegrove, Engineer and Surveyor :—

—	Milton Avenue.	Rathcoole Gardens (2nd section).	Rathcoole Gardens (3rd section).	Nightingale Lane. (2nd section).	Talbot Road.
Williamson & Sons, Limited	£1,042 2 0	£691 13 0	£1,041 10 0	£2,304 15 0	£3,528 16 6
Pedrette & Co.	1,274 1 7	835 1 8	1,249 4 2	2,790 12 11	3,839 8 9
Griffiths, W.	973 14 5	634 5 10	957 3 9	2,178 17 5	3,261 19 4
T. Adams, Wood Green, N.	932 5 5*	629 19 8*	949 16 0*	2,148 2 0*	3,162 1 1*

GOSPORT.—For the erection of Public Library and Technical Institute, for the Gosport Urban District Council. Mr. A. W. S. Cross, architect, 58, Conduit-street, Regent-street, W. Quantities by Mr. Arthur G. Cross, 6, Old Queen-street, Westminster :—

W. T. Dugan	£7,371	Middleton & Co.	£6,750
Lane & Son	7,280	Rashley & Son, Southampton*	6,693
C. F. E. Lear	7,250		
C. M. Dash	7,179		

ISLEWORTH.—For additions, &c., to Holme Court certified industrial (truant) school. Mr. W. H. Ward, architect, Paradise-street, Birmingham. Quantities by Mr. F. W. Miller, Westminster :—

Cutler	£1,770	Messom & Sons	£1,425
Nightingale	1,669	Dorey & Co.*	1,352
Wisdom	1,550		

LONDON.—For external painting and repairs at the Licensed Victuallers' Asylum, Asylum-road, Old Kent-road, S.E. Mr. W. F. Potter, architect. Quantities prepared by Mr. C. R. Griffiths, 4 and 5, Warwick-court, Gray's Inn, W.C. :—

Pritchard & Kenwick	£989	R. J. Young	£625
S. Hayworth & Sons	897	F. Dawes*	595
W. Croft	740		

LONDON.—For deep sewer at Muswell Hill, for the Hornsey District Council. Mr. E. J. Lovegrove, Engineer and Surveyor :—

Williamson & Son	£1,497 11 0	T. Adams	£942 0 5
W. Griffiths	1,432 6 0	J. A. Dunmore, Crouch End, N.*	705 7 6

NEWPORT.—For erecting schools in Bryngwyn-road., for the Newport, Mon., School Board. Messrs. Habershon, Fawckner, & Groves, architects, 41, High-street, Newport, and Cardiff.

W. Hughes	£5,649 4	J. Linton	£4,790 0
C. Shopland	5,360 0	C. Baglow	4,790 0
D. J. Davies	5,320 0	A. S. Morgan	4,750 0
E. C. Jordan	5,147 0	D. W. Richards	4,720 0
W. A. Linton	5,025 0	C. H. Reed	4,700 0
D. Davies	4,850 0	C. Lock*	4,349 0

RUSHDEN (Northants).—For the execution of road works, Robinson-road, for the Urban District Council. Mr. W. B. Madin, C.E., Vestry Hall, Rushden. Quantities supplied :—

R. Marriott	£280	W. G. Wilmott	£268

SWANSEA.—For heating work at the Swansea General and Eye Hospital :—

John Legg & Williams & Sons	£1,054 16 5 / 905 18 8	Russell & Co. / Dawson & Co., Ld, Stalyb'dge*	£892 11 1 / 859 8 1

WAKEFIELD.—For erecting 134 houses and shop for the South Kirkby Colliery Co., Limited, near Wakefield. Messrs. Garside & Pennington, architects, Pontefract, Castleford, and Selby. Quantities by architects :—

Brick and Stone-work.—Walker & Ward,* Pontefract	£10,565 18
Joinery.—Chadwick & Sons,* Staincliffe, Dewsbury	4,810 0
Slating.—Pickles Bros.,* Leeds	1,242 0
Plumbing.—Walker & Co.,* Heckmondwike	694 0
Plastering.—James Shaw,* Pontefract	1,030 3
Painting.—W. Lawrence,* Castleford	338 0

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